A large satellite dish antenna is the central focus, mounted on a complex metal structure. In the foreground, three flags are visible: the United States flag on the left, the United Kingdom flag in the center, and the Spanish flag on the right. The background shows a green hillside under a blue sky with some clouds.

JOINT USERS RESOURCE ALLOCATION PLANNING (JURAP) MEETING

October 17, 2002

Jet Propulsion Laboratory
California Institute of Technology

4800 Oak Grove Drive
Pasadena, CA 91109-8099

(818) 354-4321



October 28, 2002

Refer to: 930-02-013-ESB:lc

TO: Distribution

FROM: Eugene S. Burke

SUBJECT: Minutes for the Joint Users Resource Allocation Planning Committee Meeting held October 17, 2002.

**NEXT JURAP MEETING:
Thursday, November 21, 2002
JPL Bldg. 303, Room 411 – 1:00 p.m.**

Attendees:

Andujo, A.
Bartoo, R.
Brymer, B.
Buckley, J.
Burke, E.

Compton, B.
Doody, D.
Hall, J.
Hills, D.
Kehrbaum, J.

Kim, K.
Lacey, N.
Martinez, G.
Martinez, K.
Morris, D.

Odendahl, S.
Valencia, J.

The Joint Users Resource Allocation Planning Committee meets monthly to review the status of Flight Projects, the requirements of other resource users, and to identify future requirements and outstanding conflicts. The last regular meeting was held on October 17, 2002 at the Jet Propulsion Laboratory.

Introductory Remarks / Conflict Resolutions – G. Burke

Mr. Burke welcomed the attending Mission representatives to the JURAP meeting and stated that there were no outstanding conflicts. Mr. Burke introduced Steve Odendahl, ISTP Mission Manager for Wind, Polar and Geotail.

SPECIAL REPORTS:***POLAR, WIND – S. Odendahl (GSFC)***

An overview of the POLAR and WIND missions was presented that described future extended mission phases, orbits and trajectories, as well as extended mission science objectives. The POLAR presentation mainly covered the semi-annual flip maneuver to control spacecraft temperature, also discussed was the eclipse profile of the spacecraft. The WIND presentation discussed the activities leading up to the spacecrafts final resting point at LaGrange 1 (L1) in March 2004. It is expected that the spacecraft will remain at L1 for approximately 14 years.

RARB Action Items – D. Morris

Action Item 2 is now closed. New G/T values for the 34BWG antennas will be documented by July 2003. All other Action Items remain open although work seems to be proceeding as expected.

Resource Analysis Team – K. Kim and N. Lacey

The following changes have been made to the DSN Mission set:

- Launch date change for Lunar-A to April 1, 2004
- Launch date change MUSES-C to May 1, 2003
- Name change for Mars Smart Lander 2009 to Mars Science Laboratory 2009
- New End Of Prime Mission date for Mars Science Laboratory 2009 of March 4, 2012.

The following changes have been made to the DSN Resource Implementation Planning Matrix:

- DSS-54 20kW X-Band implementation has changed from September 01, 2003 to September 8, 2003 due to changes in the Downtime schedule.
- DSS-25 20kW X-Band implementation has changed from September 01, 2003 to September 15, 2003 due to changes in the Downtime schedule.

The RAPSO team has completed the following studies:

- Integral load study
- Selene preliminary load study

The following studies are ongoing:

- Lunar-A load study redo due to changed launch date
- Messenger load study

A high-level timeline was presented for the February 11, 2003 RARB that lists major milestones for work to be completed in preparation. To see a more detailed RARB timeline please visit the RAP Homepage (<http://rapweb.jpl.nasa.gov/>) and click RARB Timeline.

DSS Downtime Forecast – J. Valencia

The 2003, 2004, 2005 and 2006 downtime forecasts have been updated and posted to the RAP website. Many changes have been made to the downtime schedules as a result of contentions and weekly downtime meetings. Please see the attached Downtime report for details.

DSN Operations – J. Buckley

It was announced that a new format for the presentation of sub-system availability would be implemented at the next JURAP meeting in November to better present the relationship between previous performances with current statistics.

Goldstone Solar System Radar – D. Hills for M. Slade

It was reported that GSSR activities were nominal for the month of September. There are 11 observations of Near-Earth Asteroid 1997 XF11 planned. These observations will hopefully confirm Spacewatch's data on the asteroid's trajectory, which so far indicates that it will miss the Earth by 600,000 miles in 2028. There is also 2 days of observations planned for 2002SY50 to determine if it is the lost Near-Earth Asteroid Hermes, which is believed may come back close to Earth at any time.

Radio Astronomy / Special Activities – G. Martinez

It was reported that all Clock Synchronization activities during the last month were successful, however DSS-45 and DSS-65 Cat M&E activities suffered hardware and link failures resulting in a 2% data loss overall. There was also success with the Europe 65 SGP activity, although the IVS-CRF-15 SGP activity suffered a 10% data time loss due to several failures at DSS-45.

JURAP Science Advisor – E. Smith

There was no presentation given at this month's JURAP.

FLIGHT PROJECTS REPORTS***ISTP, WIND, POLAR, SOHO, GEOTAIL, Cluster II – A. Chang***

There was no presentation given at this month's JURAP.

NOZOMI – M. Ryne / A. Chang

There was no presentation given at this month's JURAP.

MAP, ACE, and IMAGE, Genesis – S. Waldherr

There was no presentation given at this month's JURAP.

Mars Global Surveyor – E. Brower

There was no presentation given at this month's JURAP, but presentation material is included in the Minutes.

Mars Odyssey – B. Mase / P. Poon

There was no presentation given at this month's JURAP.

Ulysses – B. Brymer

It was reported that all operations and supports with the Ulysses spacecraft are nominal. Currently the spacecraft drift rate requires a maneuver every 6 days.

Galileo – B. Compton

Galileo spacecraft successfully completed a close flyby of Io. It was reported that all operations with the spacecraft are nominal. Preparations for the high radiation environment expected during the Amalthea encounter are under way. It was reported that this would be the highest level of radiation the spacecraft has ever been exposed to.

Stardust / Pioneer 10 - R. Ryan

There was no presentation given at this month's JURAP.

Chandra – K. Gage

There was no presentation given at this month's JURAP.

Voyager – J. Hall

It was reported that both Voyager spacecraft are healthy and all operations are nominal. Voyager support by the DSN has been good. Voyager 1 Real Time Light Time (RTLTL) reached the 24-hour milestone.

Cassini – D. Doody

The Cassini project expressed its appreciation to all the other projects for their help in scheduling their increased requirements in 2003.

It was reported that the spacecraft is in good health and all operations are nominal. Initial indications show that the probe is also healthy after Probe Checkout number ten, although all the data has not yet been analyzed.

Wind Extended Mission Trajectory: Libration Point Orbits

Presented by Steve Odendahl, NASA Goddard Space Flight Center
October 17, 2002 JURAP



<http://www-spod.gsfc.nasa.gov/istp/wind/>

Material prepared at NASA/GSFC
by
Heather Franz, Wind Flight Dynamics Analyst
Joyce Milasuk-Ross, Wind Mission Planner

Wind Science Objectives

- To operate coordinated science campaigns with other spacecraft while in transition through orbit excursions to L1, L2, and back to L1 (where it will remain permanently):
 - Solar Flare campaign with HESSI
 - 2D Structures campaign with ACE
 - Reconnection and Reconnection Layers campaign with ACE, Cluster, Polar, Geotail, and FAST
 - Tomography campaign with IMAGE
 - Substorms campaign with Cluster, Polar, Geotail, and FAST
 - Major Solar Events campaign with ACE and SOHO
- Available to replace the ACE spacecraft when and if this becomes necessary.

Wind Mission Phases

- Prime Mission: November 1994 - October 1997
7 cycles in a dayside Double Lunar Swingby (DLS) orbit
- Extended Mission: October 1997 - Present
 - Multiple phases and orbit types (See next slide)
 - Currently in Phase 10 of Extended Mission

Wind Extended Mission Phases

<i>Phase 1</i>	Oct 97 - Nov 98	"Halo orbit loop" => DLS 2-month outer loop
<i>Phase 2</i>	Nov 98 - Apr 99	Petal orbit at 55-deg ecliptic inclination => Lunar Backflip
<i>Phase 3</i>	Apr 99 - Oct 99	DLS 3-month outer loop and phasing orbits
<i>Phase 4</i>	Oct 99 - Feb 00	Petal orbit at 26-deg ecliptic inclination => Lunar Backflip
<i>Phase 5</i>	Feb 00 - May 00	DLS 2-month outer loop and phasing orbits
<i>Phase 6</i>	May 00 - Aug 00	Petal orbit at 5-deg ecliptic inclination
<i>Phase 7</i>	Aug 00 - Sep 01	Distant Prograde Orbit of 95 x 255 Earth radii
<i>Phase 8</i>	Sep 01 - Dec 01	Petal orbit at 5-deg ecliptic inclination
<i>Phase 9</i>	Dec 01 - Jul 02	Distant Prograde Orbit of 80 x 325 Earth radii
<i>Phase 10</i>	Jul 02 - Nov 02	Petal orbit at 5-deg ecliptic inclination
<i>Phase 11</i>	Nov 02 - Aug 03	L1 Excursion
<i>Phase 12</i>	Aug 03 - Mar 04	L2 Excursion
<i>Phase 13</i>	Mar 04 - ?	L1 Lissajous Orbit

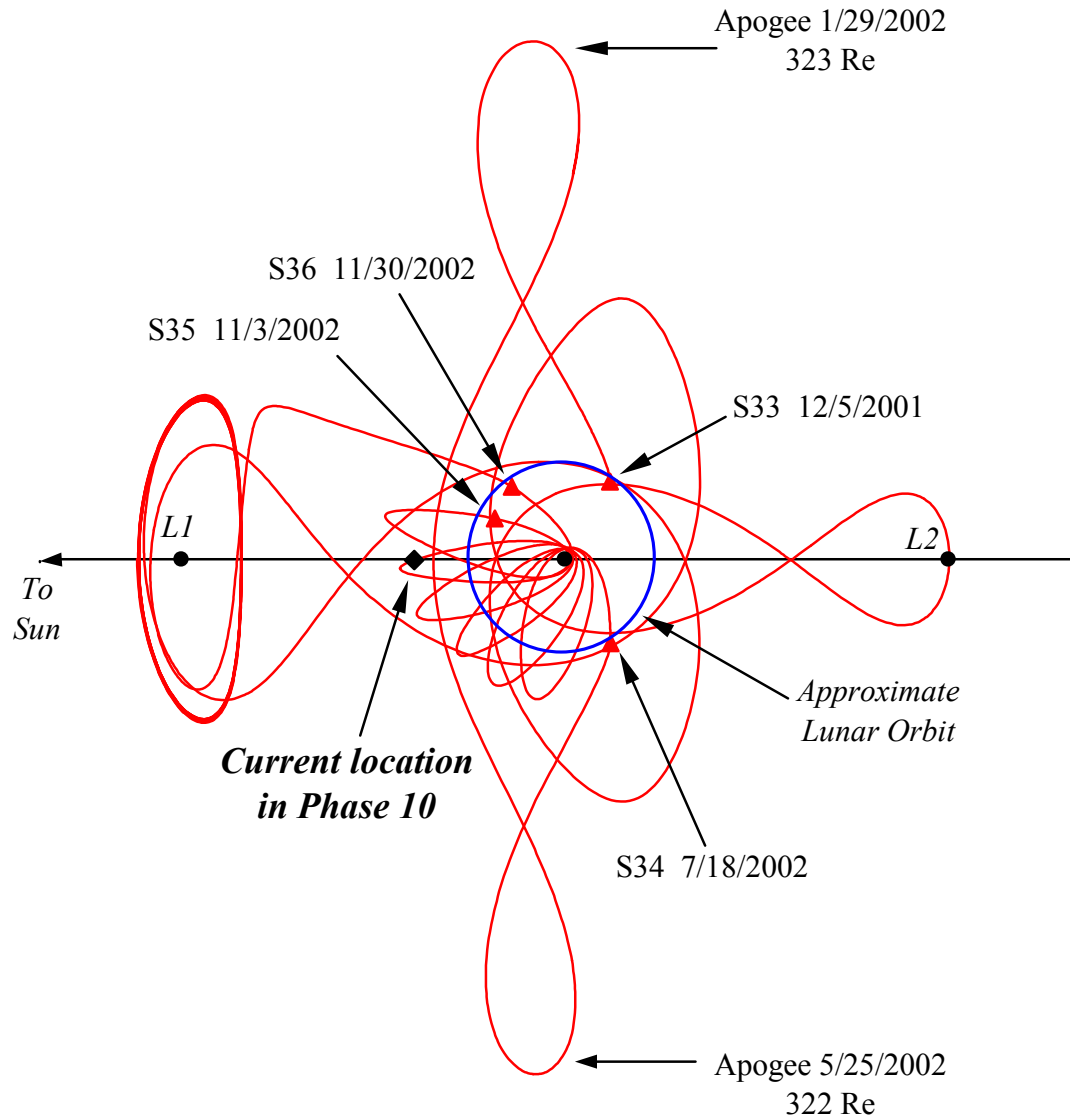
L1-centered Rotating Libration Point (L1 RLP)

Coordinate Frame Definition

(for trajectory diagrams)

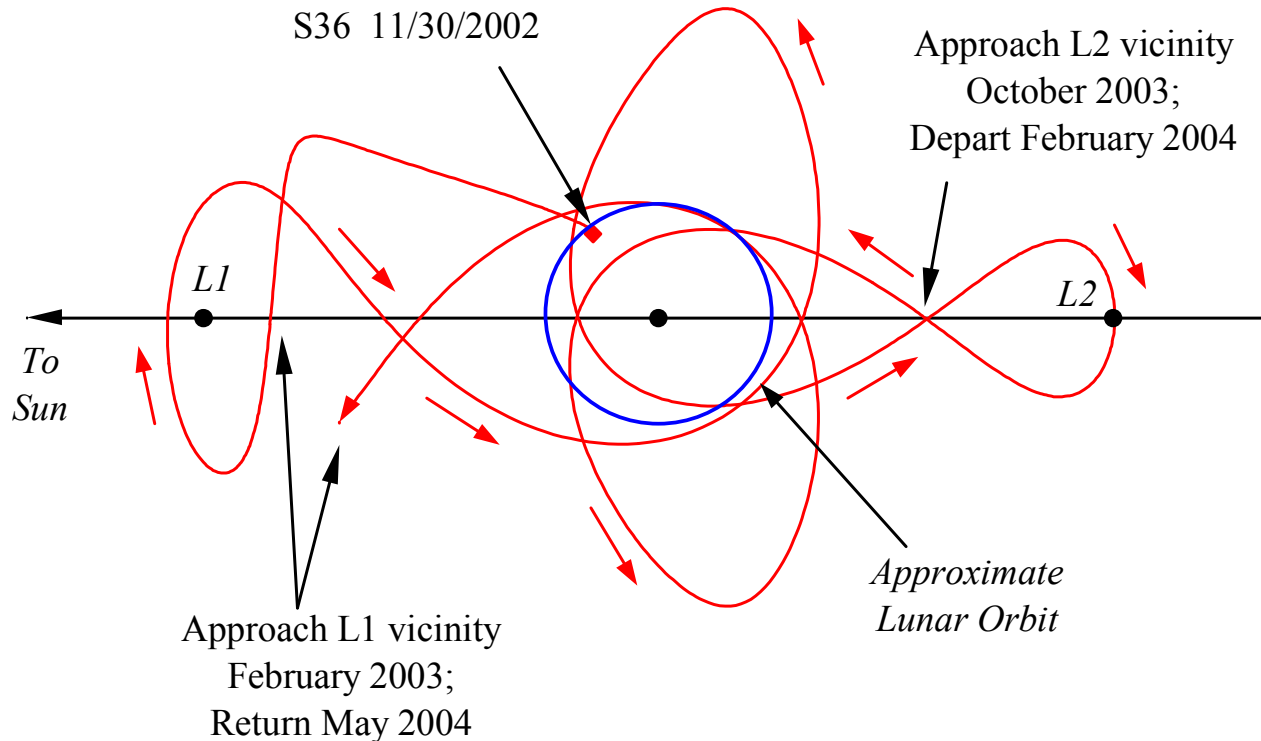
- Origin is at the L1 libration point of the Sun-Earth system
- X-axis lies along the Sun-Earth line, positive in the anti-Sunward direction
- Y-axis lies in the ecliptic plane, parallel to Earth's velocity vector
- Z-axis is parallel to North Ecliptic Pole vector

Wind Extended Mission Phases 9 - 13



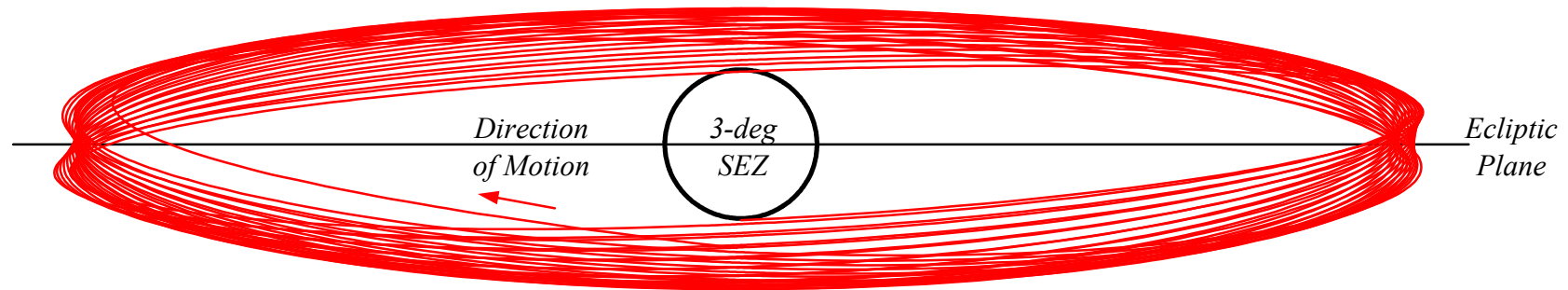
Ecliptic Plane Projection in L1 RLP Coordinates

Detail of Phases 11 - 12: L1 and L2 Excursions



Ecliptic Plane Projection in L1 RLP Coordinates

Phase 13: Second L1 Lissajous Orbit



YZ Projection in L1 RLP Coordinates (View looking from Earth toward the Sun)

Orbit remains outside 3° Solar Exclusion Zone (SEZ) for 14 years without out-of-ecliptic, “Z-axis control” maneuvers to control Lissajous orbit evolution

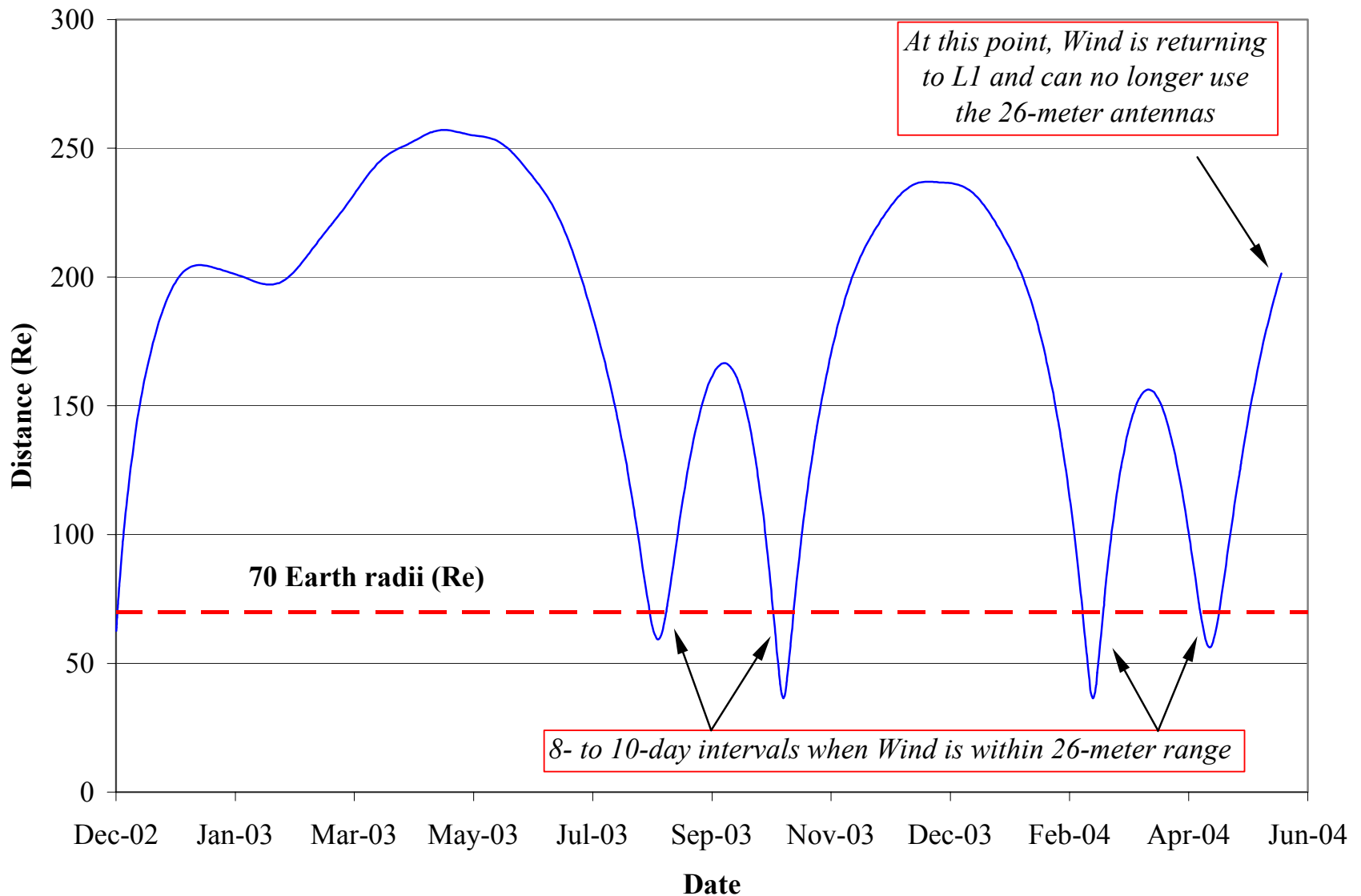
DSN Support for Wind

- Supporting DSN sites: Goldstone (DSS-24, DSS-16)
 Madrid (DSS-54, DSS-66)
 Canberra (DSS-34, DSS-46)
- The 26-meter antennas can only be used within distances of 70 Earth radii, provided that the aspect angles are within tolerable limits
- At least 2 hours of ranging are required daily to maintain a predictive orbital accuracy of 200 km during nominal mission conditions
- For accurate orbit determination, balanced ranging is required from each DSN site during each orbit determination arc (“walk through the network”)

Wind Libration Point Orbit Phases: Impact to DSN

- Wind will require the use of DSN 34-meter antennas, with very limited opportunities to use the 26-meter antennas, starting in December 2002 and extending through the remainder of the mission, as currently planned
- The exceptions to this occur at 4 distinct times during the transfer trajectories between L1 and L2, when Wind is within 70 Earth radii for 8- to 10-day intervals and could potentially use the 26-meter antennas
- As a contingency at distances beyond 70 Earth radii, Wind may use concurrent 26-meter (commanding) and 34-meter HEF (telemetry only) supports in place of the 34-meter BWG1 antennas

Wind Distance During Libration Point Orbit Phases



Conclusion

- Wind is currently in its 10th Extended Mission Phase; Phase 11, the first L1 libration point orbit phase, will begin after the S36 lunar flyby on 11/30/2002
- Wind will require the use of DSN 34-meter antennas, with very limited opportunities to use the 26-meter antennas, starting in December 2002 and extending through the remainder of the mission, as currently planned
- The exceptions to this occur at 4 distinct times during the transfer trajectories between L1 and L2, when Wind is within 70 Earth radii for 8- to 10-day intervals and could potentially use the 26-meter antennas
- As a contingency at distances beyond 70 Earth radii, Wind may use concurrent 26-meter (commanding) and 34-meter HEF (telemetry only) supports in place of the 34-meter BWG1 antennas

POLAR Flip Maneuver and Eclipse Profiles

Presented by Steve Odendahl, NASA Goddard Space Flight Center
October 17, 2002 JURAP



<http://www-spof.gsfc.nasa.gov/istp/polar/>

Material prepared at NASA/GSFC

by

Steve Hearn, POLAR Spacecraft Engineer

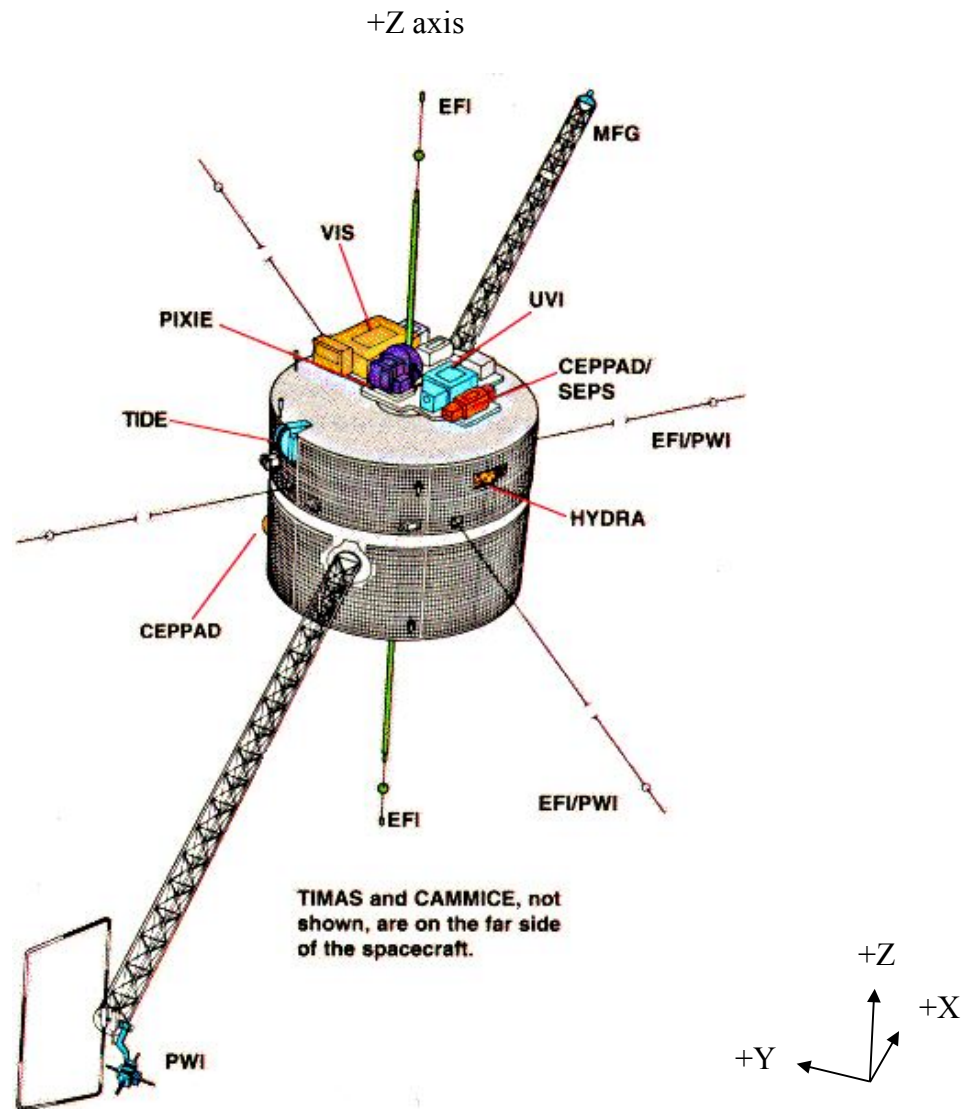
Neil Ottenstein, POLAR Flight Dynamics Analyst

Joyce Milasuk-Ross, POLAR Mission Planner

POLAR Science Objectives

- Extend the systems-science approach to Sun-Earth connections, describing the dynamic processes associated with the decline of the solar cycle
- Understand the dynamic processes associated with the equatorial region of 2-30 Re
- Investigate the global consequences of magnetic reconnection

POLAR Observatory



POLAR Orbit and Attitude Design

- Highly elliptical 18 hour Earth orbit with perigee at $1.8 R_E$ and apogee at $9 R_E$
- Spacecraft spin-axis is oriented normal to the orbit plane, causing seasonal changes in sun-angle (90 - 150°) with respect to spin-axis
- Sun-angle constraints require the 180° semi-annual precession of the spacecraft spin-axis (flip) via propulsive maneuvers
- Spacecraft spin-axis is precessed 180° to maintain orientation along orbit normal/anti-normal line

POLAR Attitude Requirements

- POLAR is designed not to permit solar radiation to directly impinge on the spacecraft +Z (top) face, location of the Despun Platform and imaging instruments
- Spacecraft batteries at risk for overheating
(Loss of batteries = Loss of mission)
- Communications subsystem Power Amplifiers at risk for overheating

POLAR Semi-annual Maneuvers

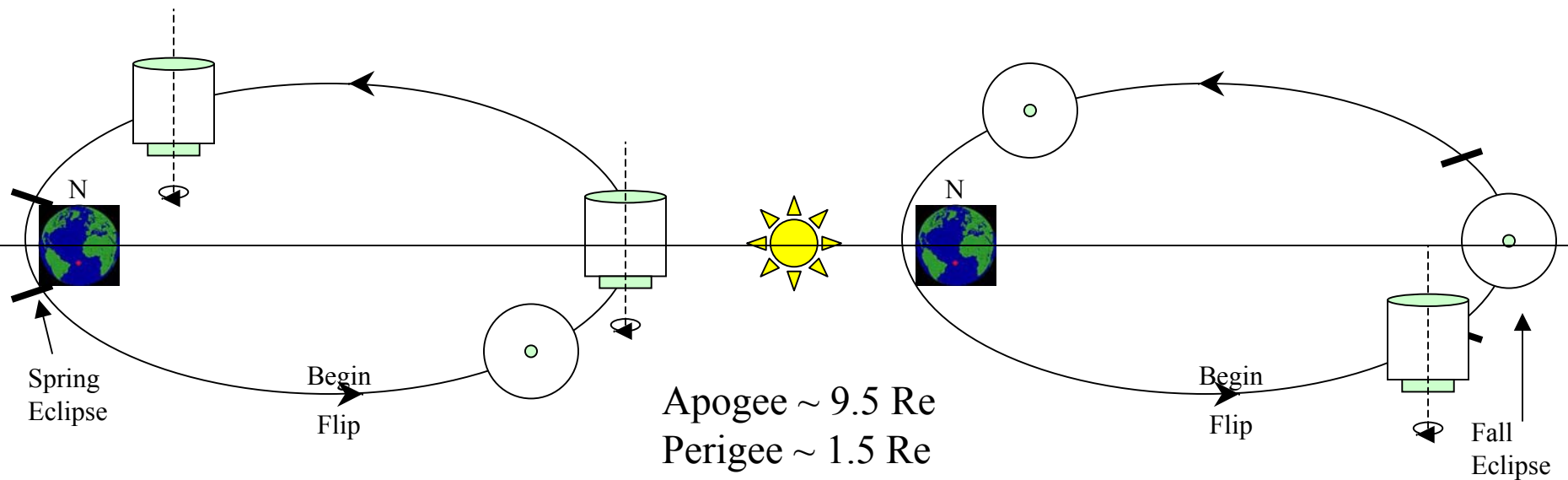
- Spin-axis precession always occurs during semi-annual eclipse seasons
- Pre-maneuver payload reconfiguration takes approximately one week to perform - optical imagers must be sun-safe
- Half flips were conducted in the Spring and Autumn of 2002
- Sufficient fuel remains on-board to perform semi-annual maneuvers through 2003

POLAR Semi-annual Maneuvers (continued)

- Spacecraft will transition to ecliptic-normal attitude when insufficient fuel remains for semi-annual flip maneuvers
- During ecliptic-normal orientation, aspect angle problems (angles less than 30° and greater than 150°) are more likely to occur when the spacecraft passes over the Earth's poles
- POLAR successfully completed its 14th flip maneuver on September 26, 2002

POLAR Semi-Annual Maneuvers - 2002

(Earth-centered Mean-of-J2000 Earth Equator Coordinates)



Flip 13 (1/2 Flip): Spring 2002

From: - Orbit Normal

To: South Ecliptic Normal

Flip 14 (1/2 Flip): Autumn 2002

From: South Ecliptic Normal

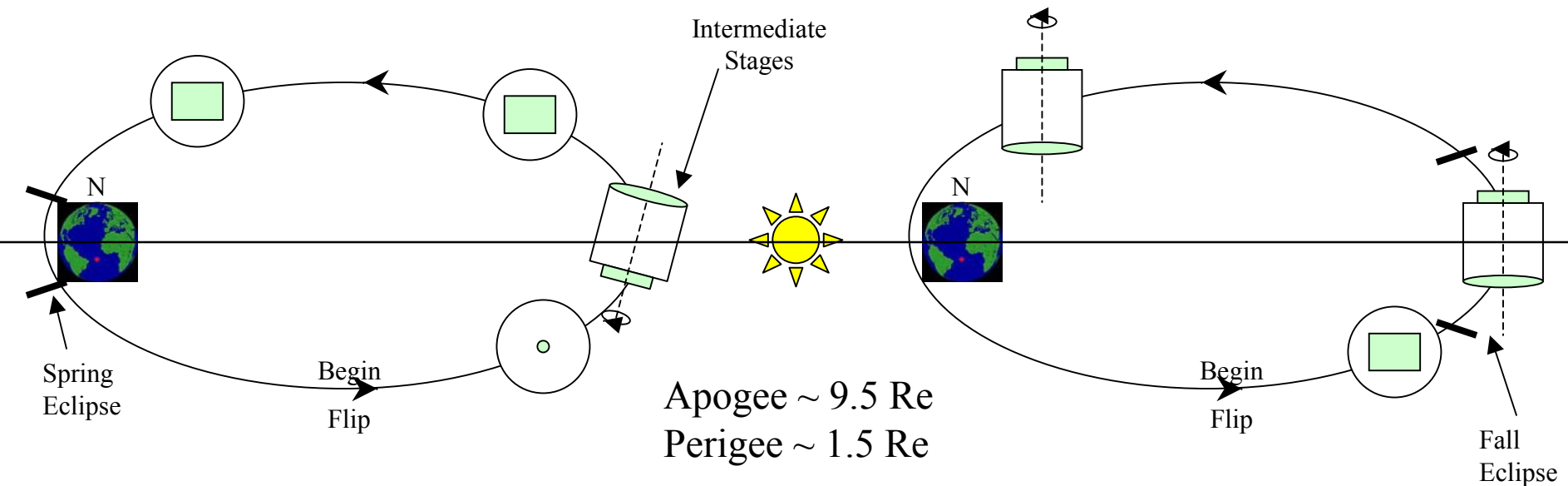
To: - Orbit Normal

POLAR Semi-annual Maneuvers (continued)

- **Flip 15** is scheduled for March 10 - 12, with post-flip trim maneuvers on March 14 or 15
- This maneuver will be executed in three 4-hour segments to maximize the perigee raise (~ 140 km)
- Spin-axis precession will be accomplished in three major segments of approximately 60° each of the 180° total precession
- Timing and site selection are critical for the perigee raise target
A shift of one hour to any segment would cost the perigee raise about 5 km for that segment and thus cause significant changes in predictions for POLAR
- This is the last opportunity to raise perigee to give proper altitude margin for science investigations

POLAR Semi-Annual Maneuvers – 2003

(Earth-centered Mean-of-J2000 Earth Equator Coordinates)



Flip 15 (Full flip): Spring 2003

From: - Orbit Normal

(Through Two Intermediate Stages)

To: + Orbit Normal

Flip 16 (1/2 flip): Autumn 2003

From: + Orbit Normal

To: North Ecliptic Normal

POLAR Semi-annual Maneuvers (continued)

- Sufficient ranging data are required for definitive orbit determination following the three maneuver segments
- Two additional maneuvers are required to trim the spacecraft attitude and main body spin rate, nominally 10 r.p.m.
- Each trim maneuver takes approximately 15 minutes to complete
- Post-maneuver payload reconfiguration takes up to two weeks to complete - optical imagers must be sun-safe

POLAR Eclipse Season

- Spacecraft experiences annual spring and autumn eclipse seasons
- Three spacecraft batteries provide sufficient power to maintain normal operations throughout each shadow
- Instruments are powered down or turned off during the autumn eclipse season to provide adequate power margin
- All three spacecraft batteries remain in excellent health
- During eclipse seasons, one shadow is experienced per 18 hour orbit

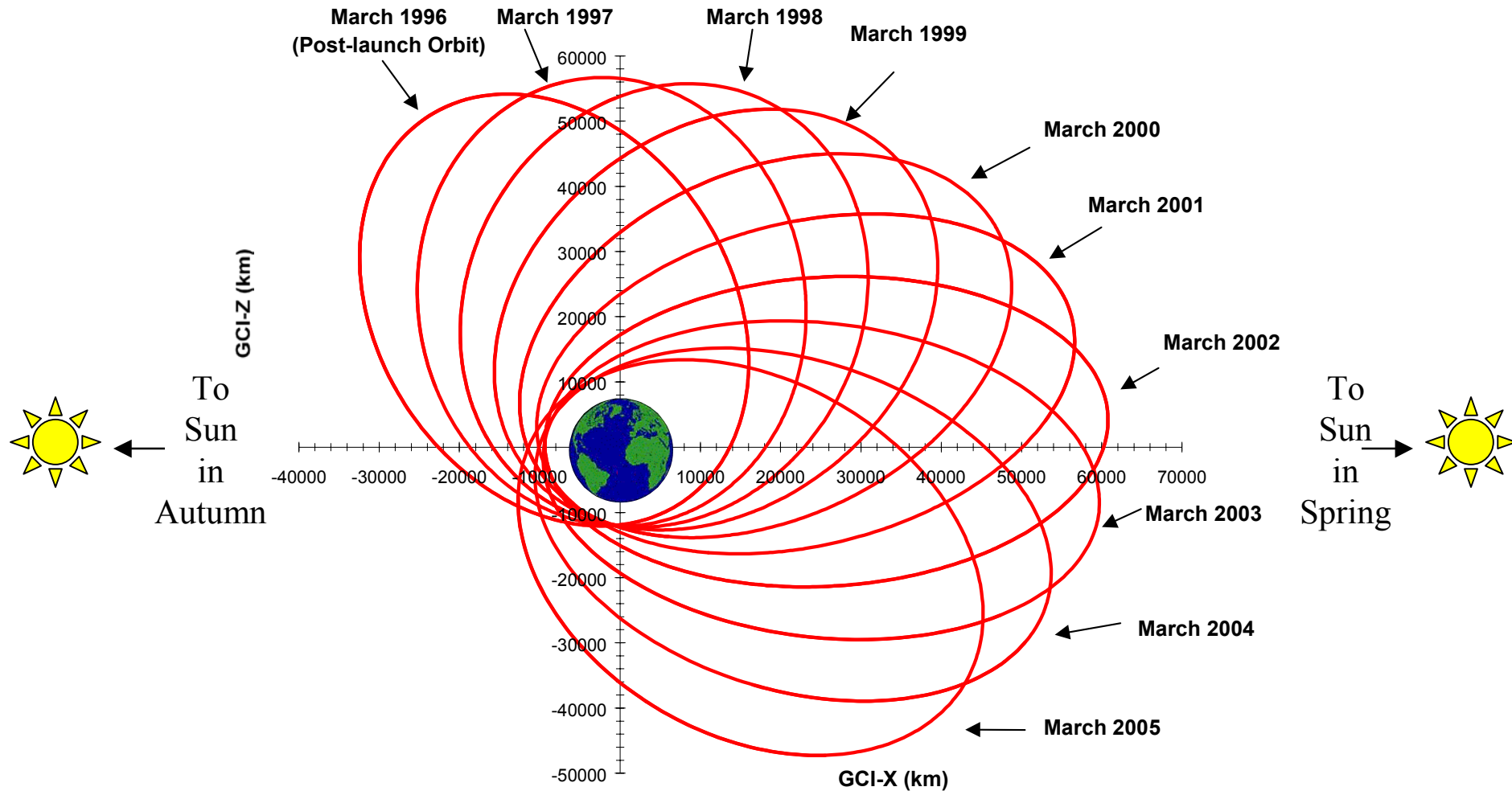
POLAR Eclipse Season

(continued)

- Maximum eclipse duration for the autumn season increased rapidly every year since launch due to orbit precession as apogee moved toward lower latitudes (Duration peaked in 2002 and will decrease thereafter)
- Maximum eclipse duration for the spring season decreased every year since launch due to orbit precession, reaching a minimum in 2003 and will increase thereafter
- Orbit apsidal precession rate is approximately 16° per year
- The longest shadow period in autumn 2003 will be 157 minutes (The maximum shadow experienced, 171 minutes, occurred in autumn 2002)

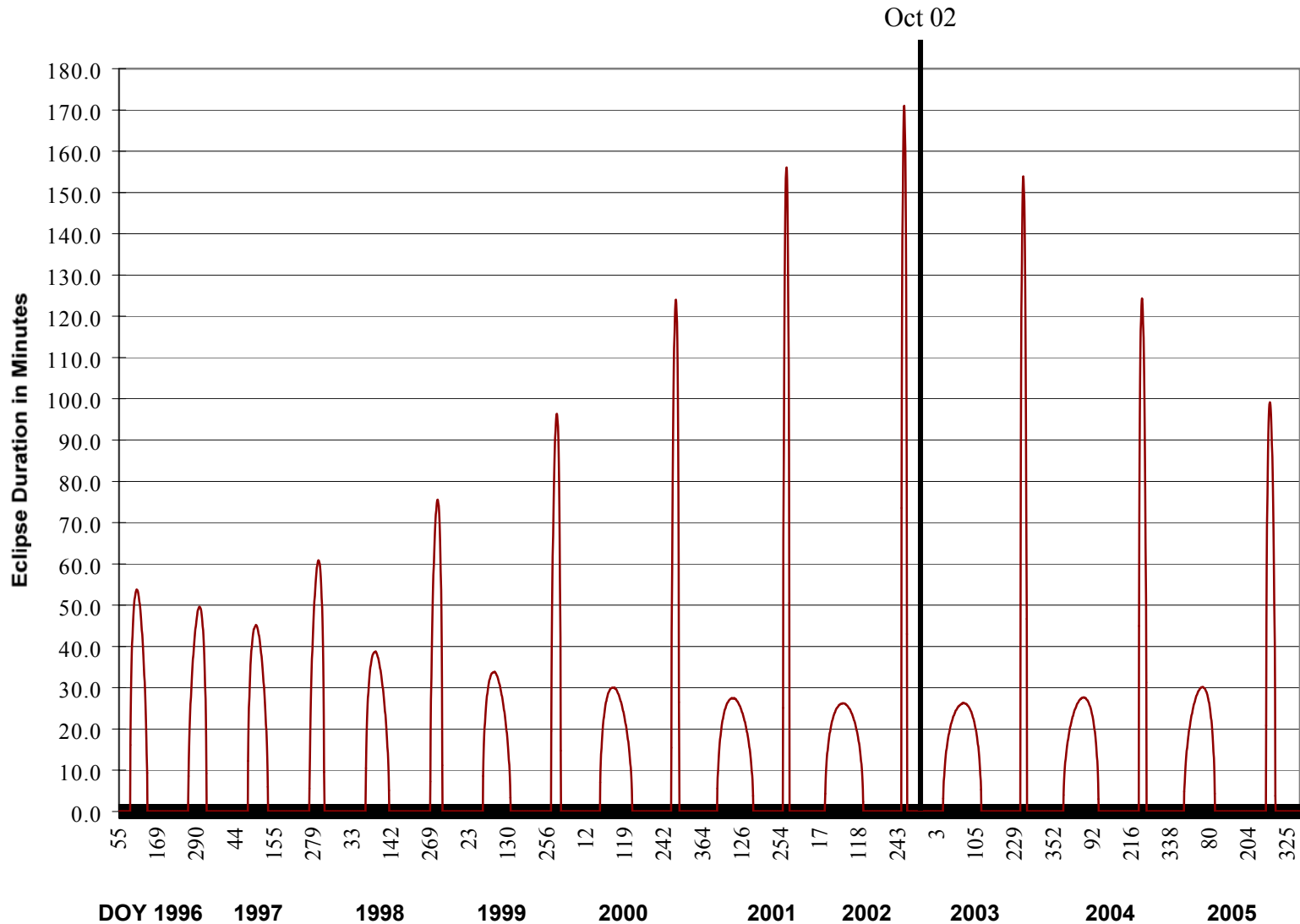
Precession of POLAR's Orbit Plane

(Earth-centered Mean-of-J2000 Earth Equator Coordinates)



POLAR Eclipse Season (continued)

--- POLAR Eclipse Duration Since Launch ---



POLAR Eclipse Season (continued)

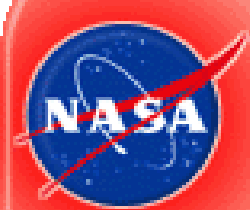
- Spacecraft encountered shadows greater than 170 minutes during Autumn 2002 eclipse season
- Spacecraft battery depth-of-discharge for 170-minute shadow was approximately 65%
- Batteries require 8 hours to fully recharge from a 170-minute shadow
- Real-time operations during the battery recharge period extends the recharge duration due to power limitations

POLAR Eclipse Season (continued)

- Spacecraft will encounter shadows of up to 157 minutes during Autumn 2003 eclipse season
- Spacecraft battery depth-of-discharge for 157-minute shadow predicted to be 43%
- Batteries expected to require 7 hours to fully recharge from a 157-minute shadow
- Autumn 2003 eclipse season begins September 3 and ends September 19

Conclusion

- Schedule of Events for Flip 15 and the Spring Eclipse season are almost conflict free
- No additional resources are required at present
- Due to criticality of the Flip Maneuver, scheduled station downtime, and two new missions, scheduling flexibility is significantly reduced during this time frame
- At ecliptic-normal attitude, antenna aspect angle considerations must be observed for proper scheduling
- We appreciate the understanding of the DSN community in helping us successfully complete this critical one-week phase of our extended mission



RAPSO

**Resource Allocation Planning
and Scheduling Office**



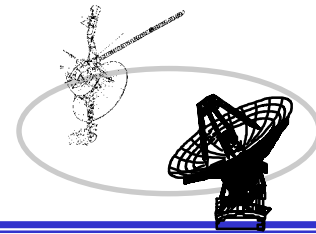
**Jet Propulsion Laboratory
California Institute of Technology**

Joint Users Resource Allocation Planning (JURAP) Meeting

October 17, 2002

Action Item Status From August 13, 2002 RARB (Resource Allocation Review Board)

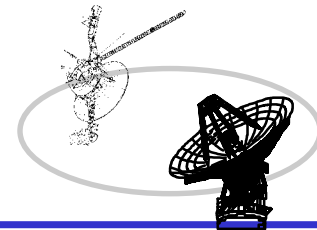
David G. Morris



Resource Allocation Planning & Scheduling Office (RAPSO)

Action Item Status

- One Action Item Closure to Report.
 - Action Item 2 is now closed. New G/T values for the 34BWG antennas will be documented by July 2003.
- All Actions Appear to Be in Work
 - New Closure Dates are Expected on Some that are Due.



Resource Allocation Planning & Scheduling Office (RAPSO)

Action Item Summary

<i>AI#</i>	<i>Year</i>	<i>Month(s)</i>	<i>System</i>	<i>Responsible</i>	<i>Due Date</i>	<i>Status</i>
01	2003	Jan-Dec	DSMS P & C	R. Miller	9/19/2002	Closed

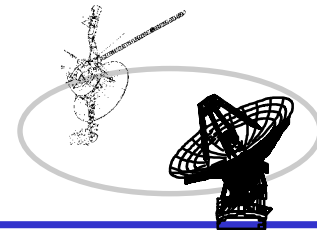
ACTION: Investigate and Negotiate the feasibility of alternate assets providing current DSN Catalog Maintenance and Enhancement (CAT M&E) radio sources.

RESPONSE: (9/19/02) The Reference Frame and Calibration Project reevaluated requirements which reduced scheduling constraints for acquiring sources. Therefore forecasted allocations should prove adequate with only some missed periods in 2003.

<i>AI#</i>	<i>Year</i>	<i>Month(s)</i>	<i>System</i>	<i>Responsible</i>	<i>Due Date</i>	<i>Status</i>
02			DSMS Engineering	J. Statman	9/19/2002	Closed

ACTION: Provide date when 810-5 will be updated with revised G/T values based upon new X/X/Ka feeds on the 34m BWG. (Reference page 28 of DSMS Engineering presentation.)

RESPONSE: (10/18/02) Module 104 will be published by 7/1/2002; measurements will be taken in February 2003.



Resource Allocation Planning & Scheduling Office (RAPSO)

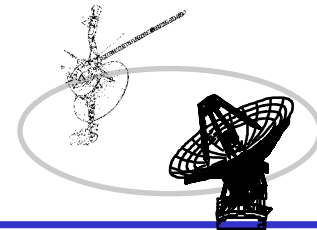
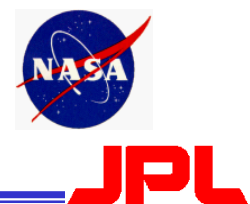
Action Item Summary

<i>AI#</i>	<i>Year</i>	<i>Month(s)</i>	<i>System</i>	<i>Responsible</i>	<i>Due Date</i>	<i>Status</i>
03	2003	July-August	GSSR & Mars Program Ofc	A. Haldeman C. Edwards	11/11/2002	Open

ACTION: Investigate and negotiate the conflicting requirements for GSSR-Mars Landing Survey vs. ongoing Mars Program spacecraft support.

<i>AI#</i>	<i>Year</i>	<i>Month(s)</i>	<i>System</i>	<i>Responsible</i>	<i>Due Date</i>	<i>Status</i>
04	2003	October	SGP	P. Wolken	9/19/2002	Open

ACTION: Consult with the Project for a decision regarding all SGP recommendations made by RAPSO and provide RARB Representative authority to negotiate recommendations that reduce SGP support.



Resource Allocation Planning & Scheduling Office (RAPSO)

Action Item Summary

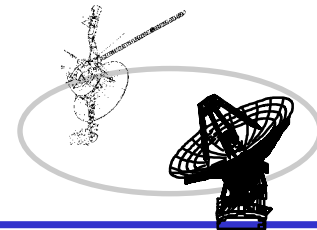
<i>AI#</i>	<i>Year</i>	<i>Month(s)</i>	<i>System</i>	<i>Responsible</i>	<i>Due Date</i>	<i>Status</i>
05	2003	December	NASA HQ Code S	B. Geldzahler	10/17/2002	Open

ACTION: Coordinate NASA Code Y to NOAA support for GOES N to be outside the 2003 – 2004 High Activity period. R. Skidmore states that the GOES-N Project is aware of the contentions and GSFC representatives will work with the Project for a decision to resolve the issues.

<i>AI#</i>	<i>Year</i>	<i>Month(s)</i>	<i>System</i>	<i>Responsible</i>	<i>Due Date</i>	<i>Status</i>
06	2003- 2004	December- April	DSMS Plans & Commit Ofc and Mars Program	R. Miller C. Edwards	10/11/2002	Pending

ACTION: Develop planning envelope for Mars Program to plan their critical support within. This is to preserve and assure other missions' committed support throughout this period as well as needed DSS Maintenance as presently defined.

RESPONSE: (9/27/2002) RAPSO has presented a summary of the proposed planning envelope to Mars Program and DSMS Plans and Commitments Office.



Resource Allocation Planning & Scheduling Office (RAPSO)

Action Item Summary

<i>AI#</i>	<i>Year</i>	<i>Month(s)</i>	<i>System</i>	<i>Responsible</i>	<i>Due Date</i>	<i>Status</i>
07	2003- 2004	December- April	Mars Program	B. Arroyo	06/01/2003	Open

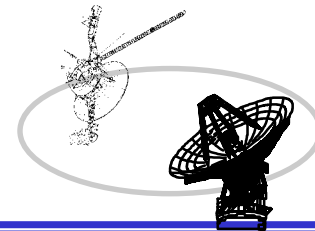
ACTION: Multi-mission DSN Allocation and Planning (MDAP) provide a Mars Program coordinated input to Resource Allocation (Mid-Range) Planning Team (RAPT) of at least one week per week at least 6 months prior to the schedule week. This action will use the result of Action Item 6 to clarify the scope of resources in which to plan to.

<i>AI#</i>	<i>Year</i>	<i>Month(s)</i>	<i>System</i>	<i>Responsible</i>	<i>Due Date</i>	<i>Status</i>
08	2005	April-June	RAPSO	N. Lacey	10/17/2002	Open

ACTION: Coordinate new plan for DSS-63 Antenna Controller Replacement Task with DSMS Engineering based upon newly defined requirements provided by Cassini.



JPL



Resource Allocation Planning & Scheduling Office (RAPSO)

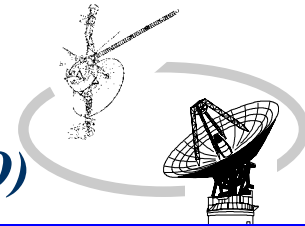
Action Item Summary

<i>AI#</i>	<i>Year</i>	<i>Month(s)</i>	<i>System</i>	<i>Responsible</i>	<i>Due Date</i>	<i>Status</i>
09	2005	July	RAPSO	N. Lacey	10/17/2002	Open

ACTION: Coordinate new plan for DSS-43 Antenna Controller Replacement Task with DSMS Engineering based upon newly defined requirements provided by Cassini.



Interplanetary Network Directorate
DEEP SPACE MISSION SYSTEMS (DSMS)



JPL

Resource Allocation Planning & Scheduling Office (RAPSO)

JOINT USERS RESOURCE ALLOCATION PLANNING COMMITTEE



Resource Analysis Team

October 17, 2002

Kevin Kim

◆ RESOURCE NEGOTIATION STATUS

- 2002 WEEKS 49 – 52 (THRU 12/29/2002) WAS RELEASED TO DSN ON 10/15/2002
- 2002 WEEKS 1 – 4 (THRU 01/26/2003) IS DUE TO BE RELEASED ON 11/08/2002
- 2003 WEEKS 19 – 22 (THRU 06/01/2003) WILL GO INTO NEGOTIATIONS STARTING 10/25/2002

◆ **SPECIAL STUDIES/ACTIVITIES**

- INTEGRAL LOAD STUDY COMPLETE
- SELENE PRELIMINARY LOAD STUDY COMPLETE

◆ **ON-GOING ACTIVITIES**

- MADB/TIGRAS TESTING AND TRAINING
- DOWNTIME PLANNING
- INTEGRAL LOAD STUDY
- LUNAR-A LOAD STUDY REDO DUE TO CHANGED LAUNCH
- MESSENGER LOAD STUDY

◆ **RARB – FEBRUARY 11, 2003**

- TIMELINE POSTED FOR FEBRUARY 11, 2003
- ULP, MISSION SET, MAJOR EVENTS AND PROPOSED DOWNTIMES SCHEDULED FOR DISTRIBUTION ON 10/22/02 (REQUEST FOR TRAJECTORY/VIEWPERIOD)
- PROJECT/USER'S RESPONSES DUE NOVEMBER 15, 2002

[HTTP://RAPWEB.JPL.NASA.GOV](http://rapweb.jpl.nasa.gov)

DSN Resource Implementation Planning Matrix										
Station	Subnet	Delivery Date	S-Band Down	S-Band Up	X-Band Down	X-Band Up	20kW X-Band	Ka-Band Down	Ka-Band Up	NSP
DSS-14	70M	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	TBD	N/A	05/13/03
DSS-15	34HEF	XXXX	XXXX	N/A	XXXX	XXXX	XXXX	TBD	N/A	04/10/03
DSS-16	26M	XXXX	XXXX	XXXX	N/A	N/A	N/A	N/A	N/A	N/A
DSS-24	34B1	XXXX	XXXX	XXXX	XXXX	12/23/02	12/23/02	10/01/05	N/A	12/23/02
DSS-25	34B2	XXXX	N/A	N/A	XXXX	XXXX	09/01/03	XXXX	XXXX	03/10/03
DSS-26	34B2	04/02/03	N/A	N/A	04/02/03	04/02/03	04/02/03	04/02/03	N/A	04/02/03
DSS-27	34HSB	XXXX	XXXX	XXXX	N/A	N/A	N/A	N/A	N/A	N/A
DSS-34	34B1	XXXX	XXXX	XXXX	XXXX	XXXX	04/07/03	01/01/05	N/A	04/07/03
DSS-43	70M	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	TBD	N/A	02/10/03
DSS-45	34HEF	XXXX	XXXX	N/A	XXXX	XXXX	XXXX	TBD	N/A	05/03/03
DSS-46	26M	XXXX	XXXX	XXXX	N/A	N/A	N/A	N/A	N/A	N/A
DSS-54	34B1	XXXX	XXXX	XXXX	XXXX	XXXX	09/01/03	08/01/06	N/A	05/13/03
DSS-55	34B2	11/01/03	N/A	N/A	11/01/03	11/01/03	11/01/03	11/01/03	N/A	11/01/03
DSS-63	70M	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	TBD	N/A	04/21/03
DSS-65	34HEF	XXXX	XXXX	N/A	XXXX	XXXX	XXXX	TBD	N/A	02/10/03
DSS-66	26M	XXXX	XXXX	XXXX	N/A	N/A	N/A	N/A	N/A	N/A
XXXX = Capability Currently Exists										
N/A = Capability Not Planned										

DSN User / Mission Planning Set 2002 - 2012

ONGOING/PLANNED PROJECTS				
Project	Acronym	Launch or Start	EOPM	EOEM
DSN Antenna Calibration	DSN	--	--	--
DSS Maintenance	DSS	--	--	--
European VLBI Network	EVN	--	--	--
Ground Based Radio Astronomy	GBRA	--	--	--
Reference Frame Calibration	DSN	--	--	--
Space Geodesy	SGP	--	--	--
Pioneer 10 ACS	PN10	03/03/72	07/01/97	09/30/08
Voyager 2	VGR2	08/20/77	10/15/89	09/30/07
Voyager 1	VGR1	09/05/77	12/31/80	09/30/07
Goldstone Solar System Radar	GSSR	04/01/85	--	--
Galileo	GLLO	10/18/89	12/07/97	09/21/03
Ulysses	ULYS	10/06/90	09/11/95	09/30/04
ISTP - Geotail	GTL	07/24/92	07/24/95	09/30/07
ISTP - Wind	WIND	11/01/94	11/01/97	09/30/07
ISTP - SOHO	SOHO	12/02/95	05/02/98	09/30/07
ISTP - Polar	POLR	02/22/96	08/23/97	09/30/07
Gravity Probe B	GPB	06/01/96	01/01/05	TBD
Mars Global Surveyor	MGS	11/07/96	02/01/01	06/01/04
Advance Composition Explorer	ACE	08/25/97	02/01/01	09/30/07
Cassini	CAS	10/15/97	06/30/08	06/30/10
Nozomi (Planet-B)	NOZO	07/03/98	12/31/05	TBD
Stardust	SDU	02/07/99	01/14/06	- - -
Chandra X-ray Observatory	CHDR	07/23/99	07/24/09	07/24/14
Imager for Magnetopause-to-Aurora Global Exploration	IMAG	03/25/00	05/30/02	09/30/07
Cluster 2 - S/C #2 (Samba)	CLU2	07/16/00	02/15/03	09/30/07
Cluster 2 - S/C #3 (Rumba)	CLU3	07/16/00	02/15/03	09/30/07

DSN User / Mission Planning Set 2002 - 2012

ONGOING/PLANNED PROJECTS				
Project	Acronym	Launch or Start	EOPM	EOEM
Cluster 2 - S/C #1 (Salsa)	CLU1	08/09/00	02/15/03	09/30/07
Cluster 2 - S/C #4 (Tango)	CLU4	08/09/00	02/15/03	09/30/07
2001 Mars Odyssey	M01O	04/07/01	08/01/04	09/19/07
Microwave Anisotropy Probe	MAP	06/30/01	10/01/03	10/01/06
Genesis	GNS	08/08/01	09/08/04	---
Mission Enhancement by Ground-based Astronomy	MEGA	02/01/02	12/31/03	---
Comet Nucleus Tour (CONTOUR)	CNTR	07/03/02	09/05/08	TBD
International Gamma Ray Astrophysics Lab	INTG	10/17/02	12/18/04	12/18/07
Space Infrared Telescope Facility	STF	01/09/03	04/19/08	---
Rosetta	ROSE	01/13/03	07/10/13	---
MUSES - C	MUSC	05/01/03	06/05/07	---
Mars Express Orbiter	MEX	05/23/03	02/11/06	08/03/08
Mars Exploration Rover - A	MERA	05/30/03	04/06/04	05/11/04
Mars Exploration Rover - B	MERB	06/25/03	04/27/04	06/15/04
Deep Impact	DIF	01/02/04	08/05/05	---
Messenger	MSGR	03/10/04	04/06/10	---
Lunar - A	LUNA	04/01/04	07/18/04	---
Space Technology 5	ST5	07/15/04	10/15/04	TBD
Mars Reconnaissance Orbiter	MRO	08/08/05	11/26/08	12/31/10
Stereo Ahead	STA	11/15/05	02/18/08	---
Stereo Behind	STB	11/15/05	02/18/08	---

ADVANCED PLANNING PROJECTS				
Project	Acronym	Launch or Start	EOPM	EOEM
Selene	SELN	07/04/05	09/30/06	---
Dawn	DAWN	05/27/06	07/26/15	TBD
Kepler	KPLR	10/15/06	10/14/10	TBD
Mars Competed Scout 2007	M07S	09/04/07	08/19/08	TBD
Mars CNES Premier Orbiter 2007	M07O	09/11/07	08/11/08	08/12/10
Mars ASI/NASA Marconi Telecommunications Orbiter 2007	M07T	08/23/07	07/18/18	TBD
Mars ASI/NASA Science Orbiter 2009	M09O	10/04/09	08/29/12	TBD
Mars Science Laboratory 2009	M09L	10/25/09	03/04/12	TBD
Solar Probe	SOLP	05/01/10	02/14/14	TBD
Highly Advanced Laboratory for Communications and Astronomy	VSP2	06/15/10	06/15/15	---
Mars CNES MSR Lander 2011	M11L	10/30/11	09/10/14	TBD
Mars CNES MSR Orbiter 2011	M11O	10/30/11	07/22/14	TBD

Resource Allocation Review

2004 – 2012

February 11, 2003

TIMELINE

<u>Calendar Date</u>	<u>Work Days Remaining</u>	<u>Milestones</u>
10/22/02	73 Days	Distribute Mission Set, Major Events and User Loading Profiles to Projects/Users for verification
11/15/02	55 Days	Deadline for Projects/Users response to Mission, Set, Major Events, and User Loading Profiles. Last Day For Trajectory or Viewperiod updates and submissions.
11/27/02	47 Days	Start preliminary requirements analysis and recommendations
01/14/03	19 Days	NASA Headquarters Science Review
01/22/03	14 Days	Post preliminary Contentions/Recommendations on the RAPWEB for Projects/Users review
01/31/03	07 Days	Complete Projects/Users Review
02/06/03	03 Days	Post final Contentions and Recommendations on the RAPWEB
02/10/03	01 Days	Distribute booklets to RARB Board Members
02/11/03	0 Days	Resource Allocation Review Board Meeting

DSN Antenna Downtime Status and Forecast

Jose Valencia

October 17, 2002

Antenna Downtime Status And Forecast

■ 2002

- No additions or changes to antenna downtimes
- DSS-24 NSP/20kwatt X-band downtime will proceed as scheduled beginning in week 43 and ending in week 51
 - The task will focus on providing 20Kwatt S-Band uplink capability, and implement as much of X-band as possible.

■ 2003

- No additions or changes to antenna downtimes

■ 2004

- Added DSS-14 antenna downtime proposal for Hydrostatic Bearing upgrade from week 39 through 46
- Added DSS-45 antenna downtime proposal for Antenna Controller Replacement from week 43 through 49
- Added DSS-45 antenna downtime proposal for USC in weeks 43, 44

Antenna Downtime Status And Forecast (continued)

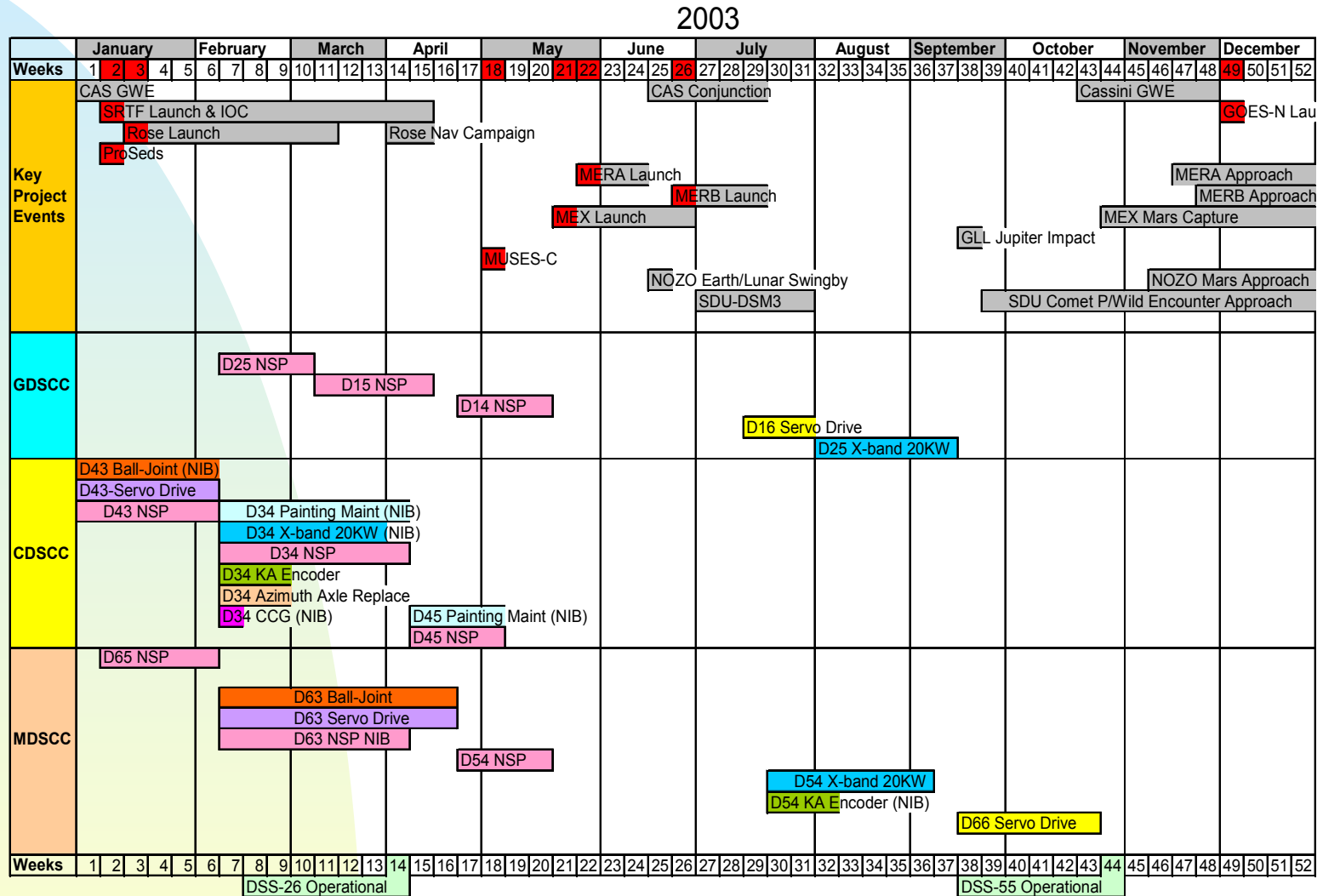
- 2005
 - Added DSS-63 antenna downtime proposal for Antenna Controller Replacement from week 38 through 44
 - Added DSS-63 antenna downtime proposal for USC in weeks 38, 39
- 2006
 - No additions or changes to antenna downtimes

Antenna Downtimes and Proposed Changes in 2002

2002

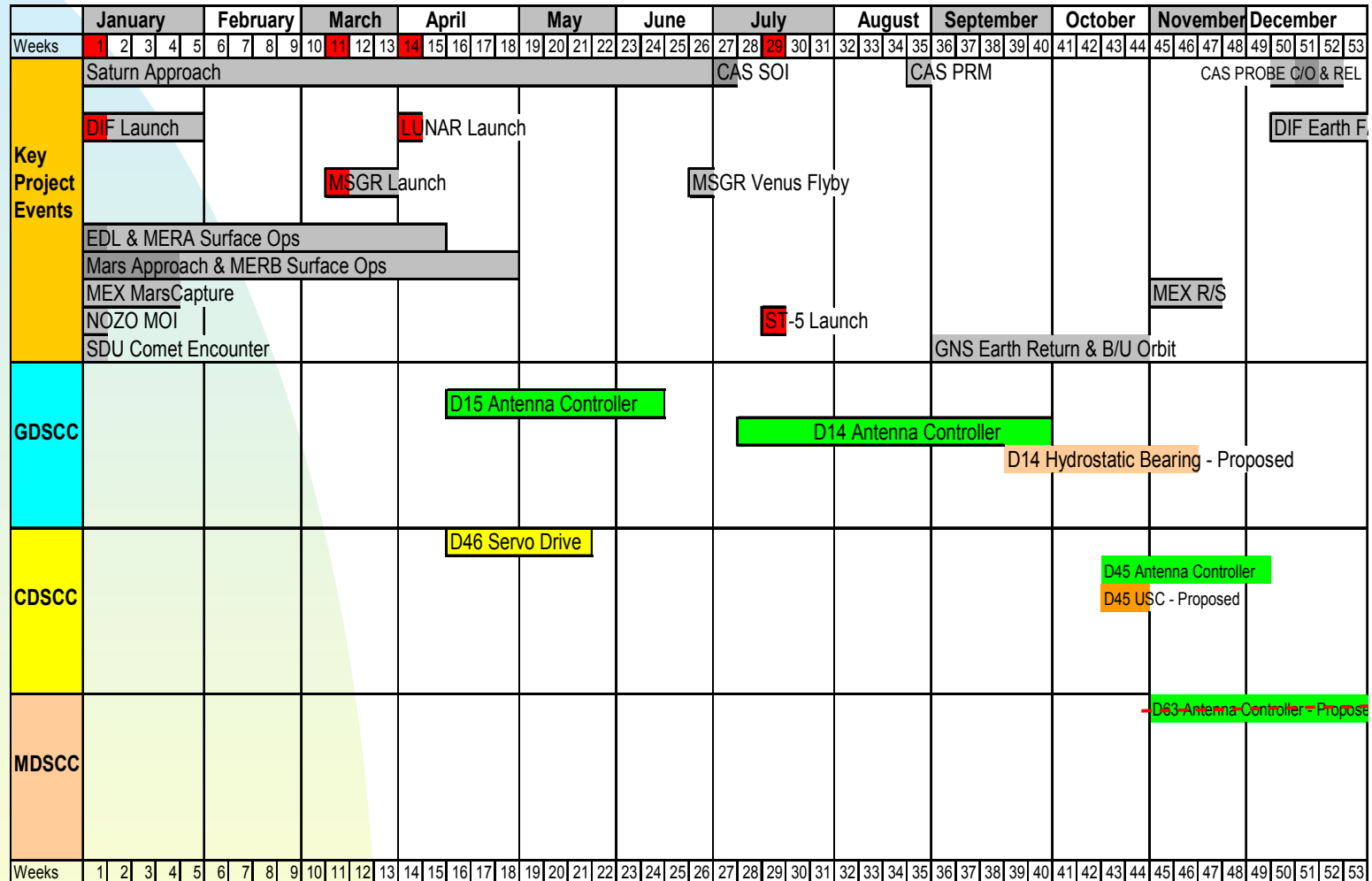
[illegible]

Antenna Downtimes and Proposed Changes in 2003



Antenna Downtimes and Proposed Changes in 2004

2004



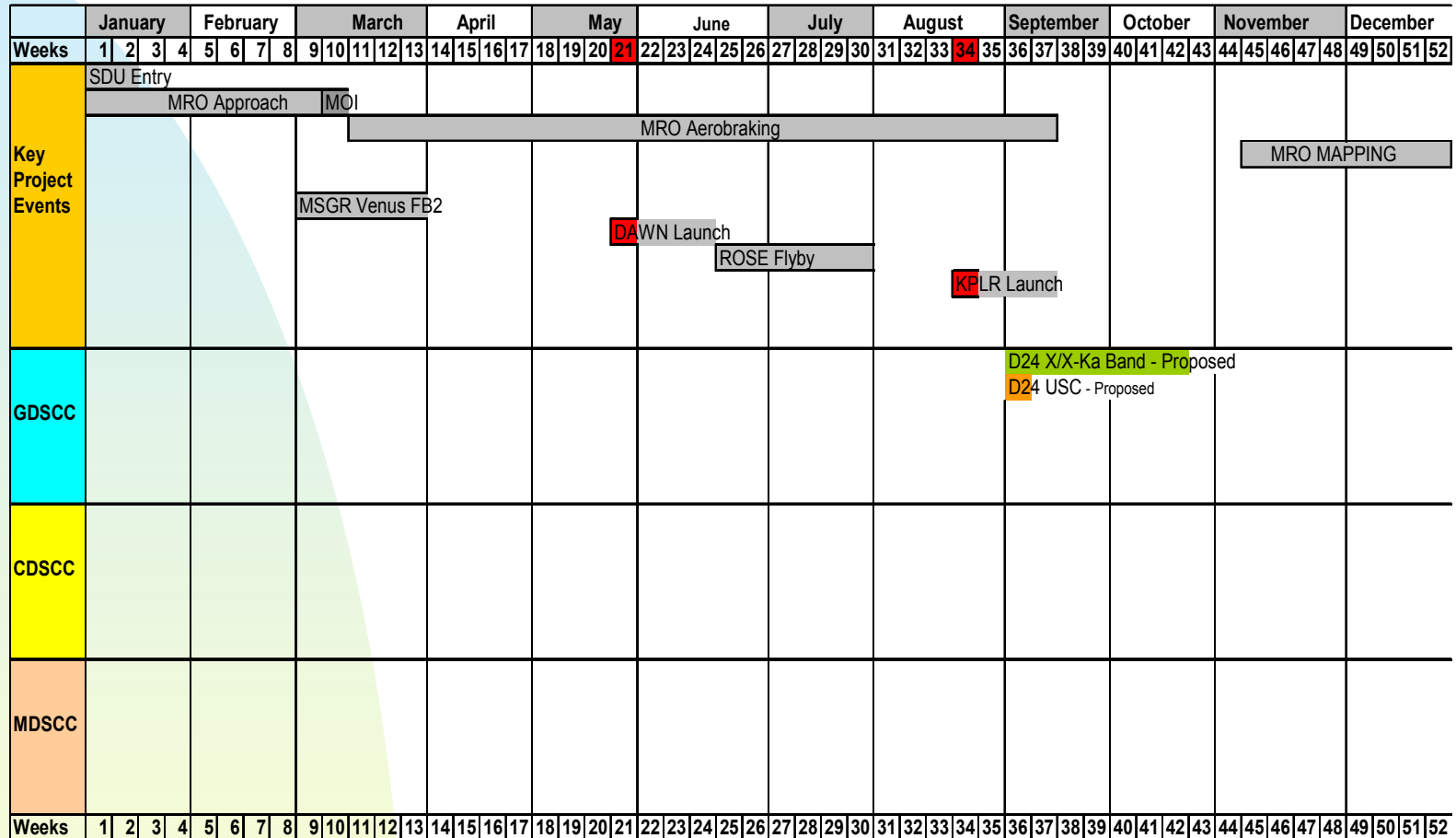
Antenna Downtimes and Proposed Changes in 2005

2005

	January				February				March				April				May				June				July				August				September				October				November				December																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Weeks	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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Antenna Downtimes and Proposed Changes in 2006

2006

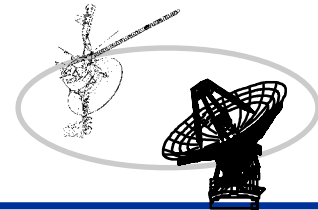




JPL

InterPlanetary Network Directorate

Deep Space Mission System Operations Program Office



JOINT USERS RESOURCE ALLOCATION PLANNING COMMITTEE

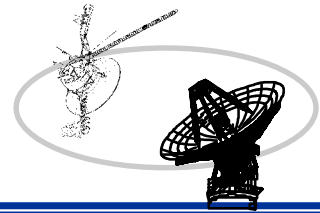
DSN Operations

Jim Buckley

October 17, 2002

NASA / Jet Propulsion Laboratory

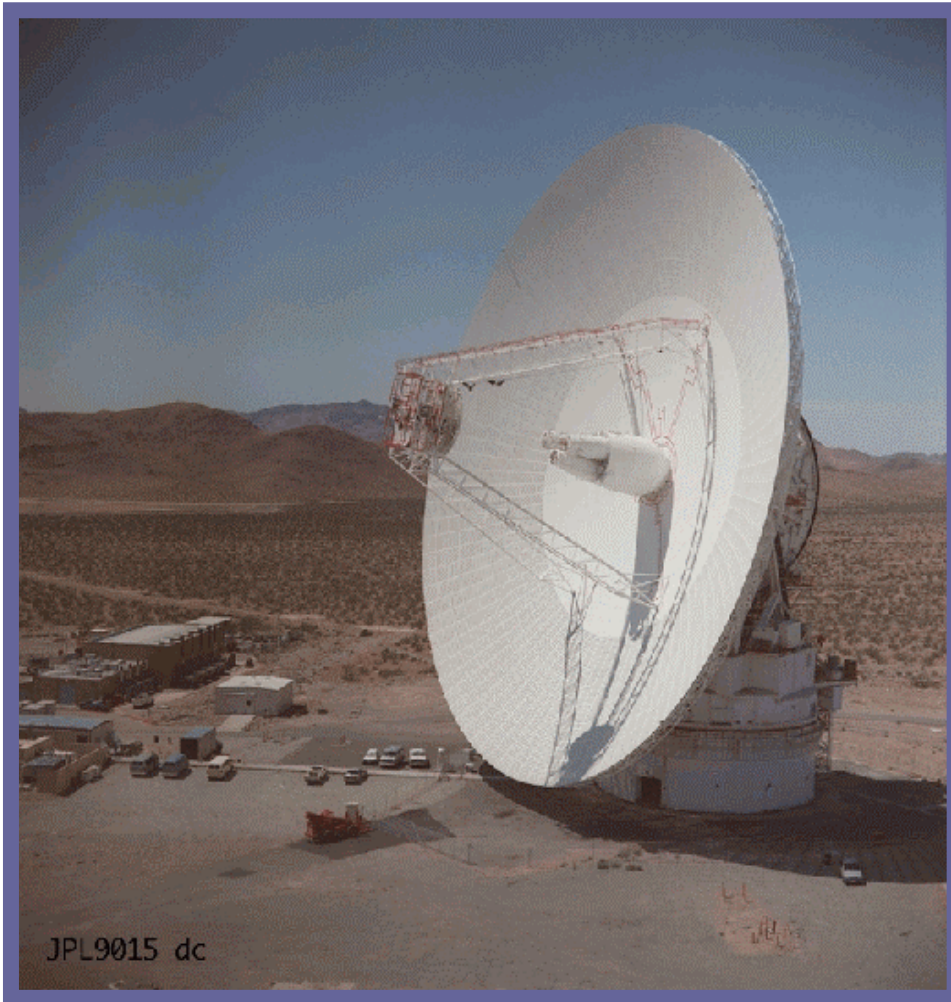




DSN System Availability

<u>Data Type</u>	<u>July</u> <u>2002</u>	<u>August</u> <u>2002</u>	<u>September</u> <u>2002</u>
Telemetry	99.2%	98.79%	98.85%
Tracking	98.73%	98.34%	98.72%
Command	98.59%	98.32%	98.44%
Monitor	97.40%	99.31%	98.95%
Radio Science	99.97%	98.84%	99.97%
VLBI	96.26%	99.74%	96.95%

Goldstone Solar System Radar



JPL9015 dc

Martin A. Slade

Oct 17, 2002

NASA Jet Propulsion Laboratory

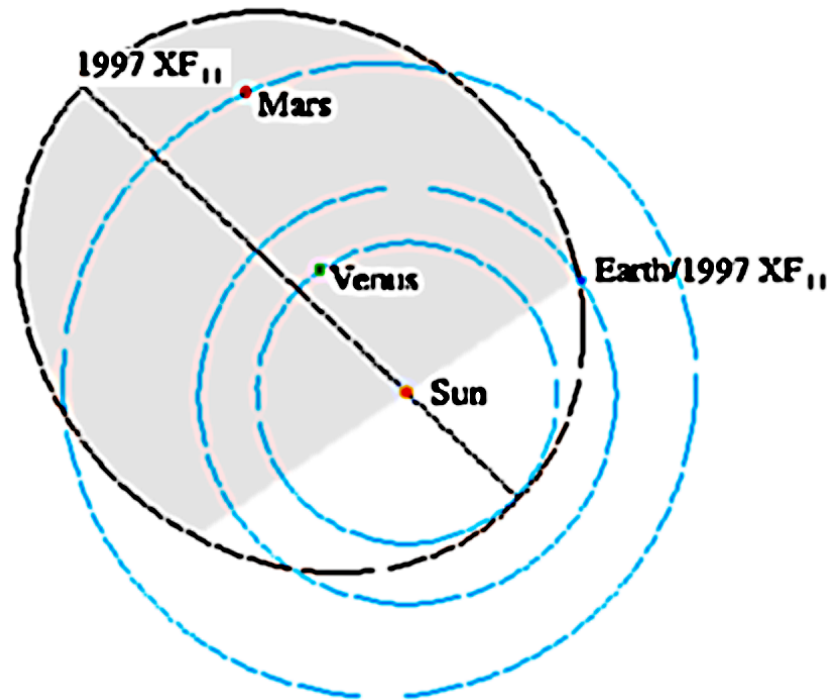
Joint Users Resource Allocation Planning Committee Meeting



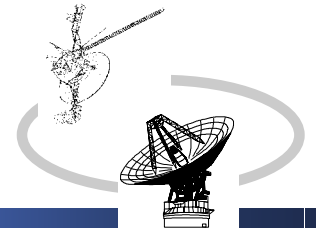
From Oct. 25 to Nov. 11, GSSR will be making 11 observations of near-Earth asteroid 1997 XF11. (In addition, two days of observing NEA 2002SY50 will be performed to discover if it is the long-lost NEA Hermes.)

The initial Spacewatch orbit for 1997 XF11 indicated that this NEA might hit the Earth. Pre-discovery images from Palomar on 1990 Mar. 22 and 23 allowed a much improved orbit to be derived for 1997 XF11. These latest computations show that the nominal miss distance will be 600 thousand miles on 2028 Oct. 26 around 2:30 a.m. Eastern Daylight Time. Although the chances for an actual collision with the earth in 2028 can now be discounted, the orbit of 1997 XF11 will continue to come close to the orbit of the earth for the foreseeable future. Further future notable close approaches to the earth will occur in

- 2002 (5.9 million miles)**
- 2078 (7.5 million miles)**
- 2090 (4.2 million miles)**
- 2095 (1.3 million miles).**



Orbital Diagram of the Inner Solar System with 1997 XF11



Radio Astronomy & Special Activities

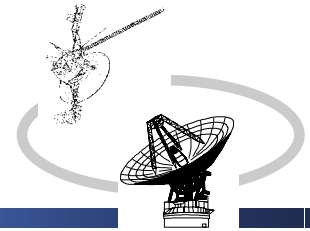
October 17, 2002

George Martinez



TEMPO

(Time and Earth Motion Precision Observations)



- **Clock Sync**

- **DOY246**

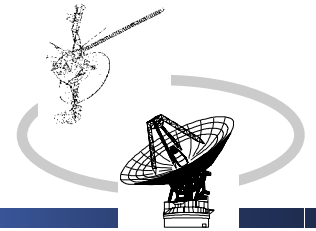
- No problems were reported by either DSS-15 or DSS-65.
 - Data tapes sent to JPL correlator.

- **DOY 264**

- No problems were reported by either DSS-15 or DSS-65.
 - Data tapes sent to JPL correlator.

- **DOY 272**

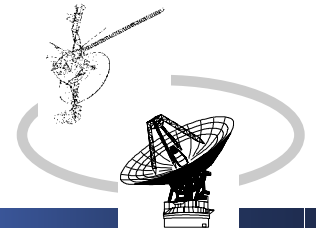
- No problems were reported by either DSS-15 or DSS-65.
 - Data tapes sent to JPL correlator.



- **DOY 250**
 - DSS-65 reported a tape drive vacuum failure.
 - No problems were reported by DSS-15
 - Data tapes sent to the JPL correlator.
- **DOY 257**
 - DSS-45 reported the the PCFS lost interface and the recording tape broke.
 - No problems were reported by DSS-15.
 - Data tapes sent to the JPL correlator.
- **Metrics**
 - 98% of data time utilized.



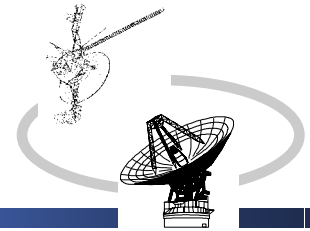
Space Geodesy Program (SGP)



- **Europe-65**
 - The purpose of this experiment is to determine station coordinates and their evolution in the European geodetic VLBI network with the highest precision possible .
 - No problems were reported by the station.
 - Data tape sent to the Bonn correlator.



Space Geodesy Program (SGP) – contd.



- **IVS-CRF-15**
 - The IVS-CRF experiments are astrometric observations to strengthen the International Celestial and Reference Frames (ICRF) in the Southern Hemisphere by observing ICRF defining and candidate sources.
 - DSS-45 reported the following problems:
 - Tape ran off reel.
 - Antenna stopped tracking.
 - EAC stopped.
 - Antenna was stowed twice due to high winds.
 - Data tape sent to the Washington correlator.
- **Metrics**
 - 90% of data time utilized.



ulysses

JOINT USERS RESOURCE ALLOCATION PLANNING COMMITTEE

B. Brymer

October 17, 2002

NASA Jet Propulsion Laboratory



<http://ulysses.jpl.nasa.gov/>

ULYSSES

JOINT USERS RESOURCE ALLOCATION PLANNING COMMITTEE

- SPACECRAFT OPERATIONS ARE NOMINAL
- SPACECRAFT POWER AND THERMAL RECONFIGURATIONS AND INSTRUMENT CALIBRATIONS ARE PERFORMED AS REQUIRED
- SPACECRAFT EARTH POINTING MANEUVERS ARE BEING PERFORMED EVERY 6 DAYS
- SATISFACTION WITH SCHEDULING / RESOURCES GROUPS: HIGH

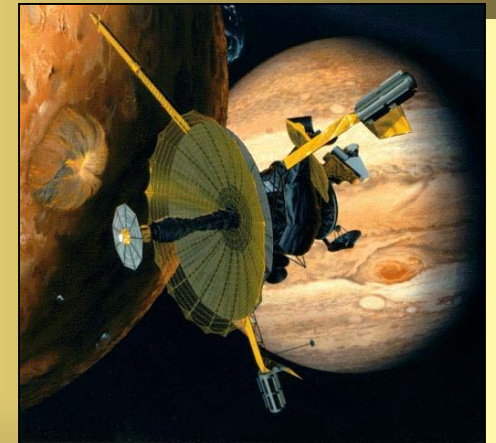
Galileo

Journey to Jupiter

JOINT USERS RESOURCE ALLOCATION PLANNING COMMITTEE



Brad Compton
June 20, 2002



NASA / Jet Propulsion Laboratory

<http://galileo.jpl.nasa.gov/>



GALILEO MILLENNIUM MISSION

ROUTINE ACTIVITIES

- Propulsion maintenance.
- Attitude maintenance turn.
- Science instrument MROs.



GALILEO MILLENNIUM MISSION

SIGNIFICANT EVENTS

- Executed Orbit Trim Maneuver 108.
- Continued collecting Magnetometer, Dust Detector and Extreme Ultraviolet data.
- A number of modifications are being made to CDS flight software and onboard safing routines in preparation for the high radiation environment expected during the Amalthea encounter.

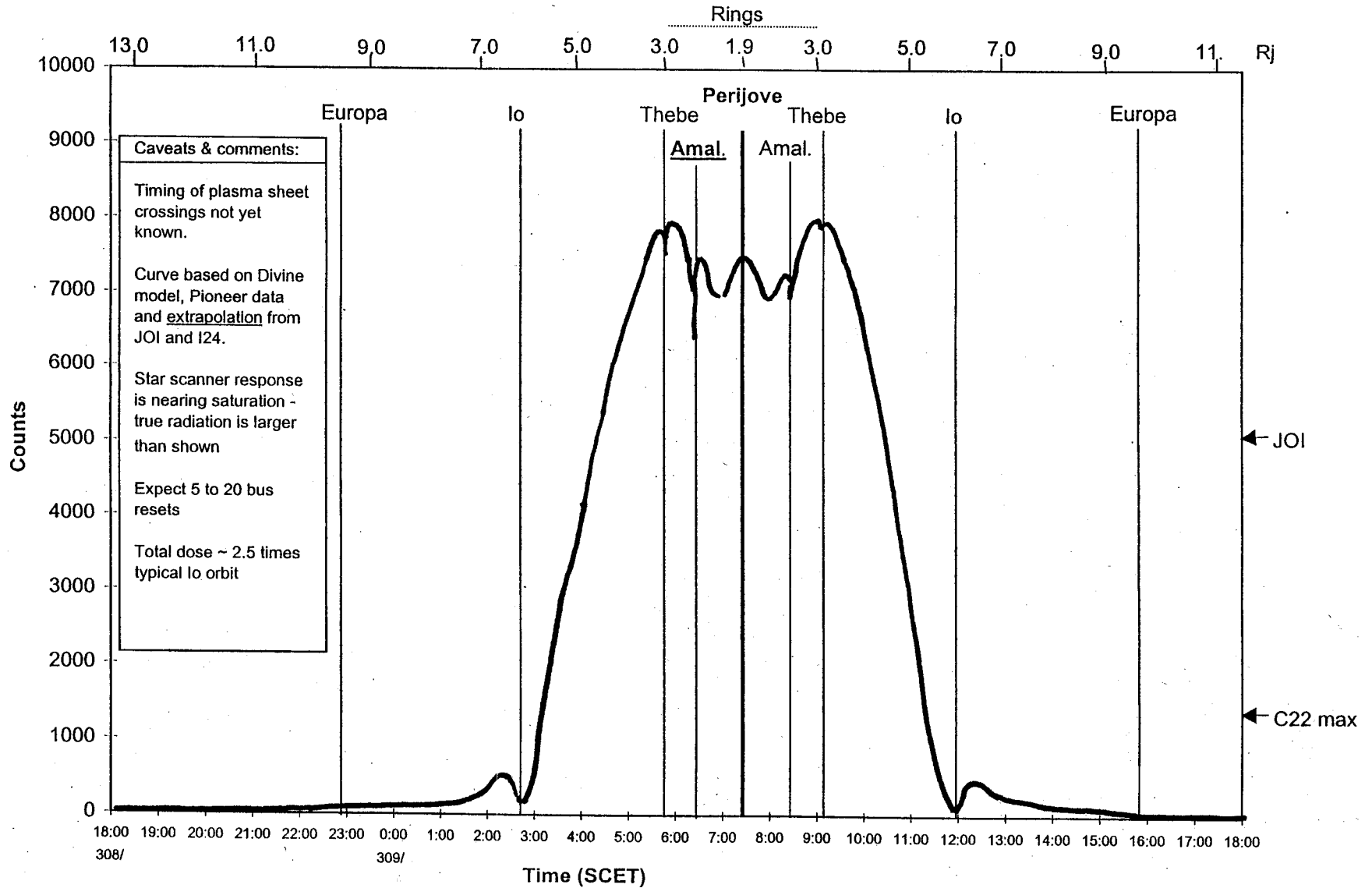


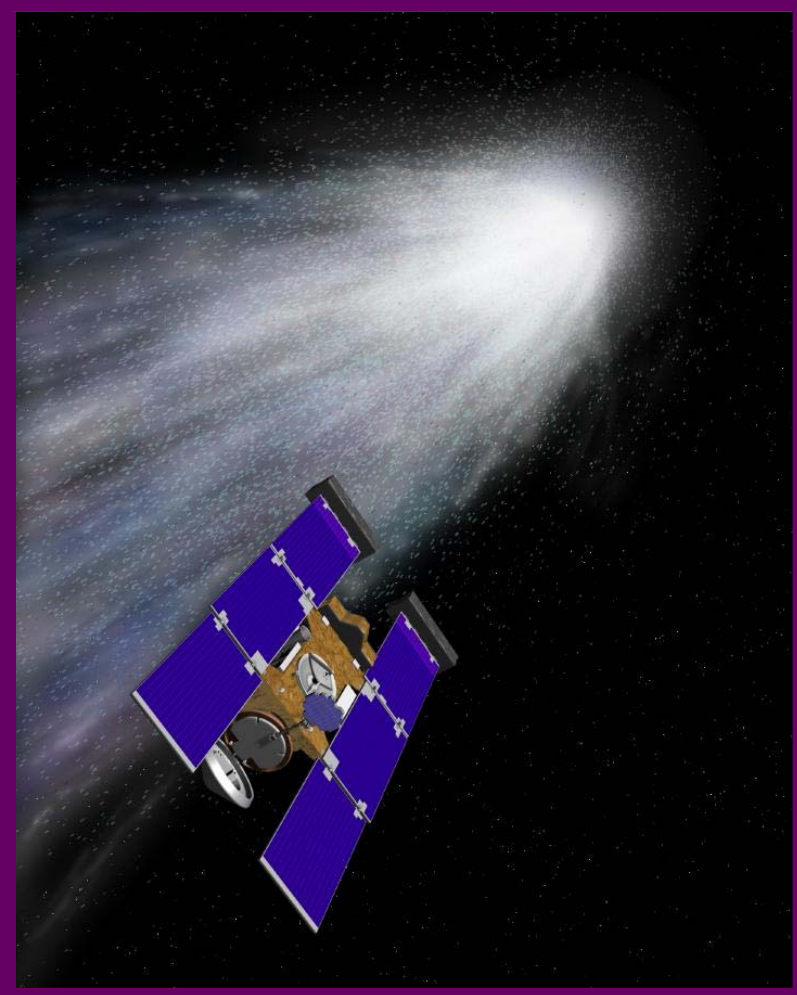
GALILEO MILLENIUM MISSION

PROJECT PLANS

-
- Continue tape recorder characterization/conditioning.
- Continue collecting MAG, DDS and EUV data.
- Execute Orbit Trim Maneuver 109.
- Next encounter Amalthea 34 on 5 November.

A34A Predicted Background Radiation





STARDUST

JOINT USERS

RESOURCE ALLOCATION

PLANNING COMMITTEE

R. E. Ryan
October 17, 2002

NASA Jet Propulsion Laboratory

<http://stardust.jpl.nasa.gov>

STATUS

SPACECRAFT IS HEALTHY (10/17/02)

PRESENTLY 2.09 AU from EARTH

00:34:45 RTLT

2.40 AU from SUN

- **BIT RATE IS AT 504 bps (on HGA/34 HEF)**
- **EARTH RANGE IS INCREASING**
 - **S/C COMING BACK IN BUT EARTH MOVING AWAY**
- **SOLAR RANGE IS DECREASING**
 - **THE POWER RESTRICTIONS ARE EASING**
- **TCM-7A SUCCESSFULLY COMPLETED ON OCTOBER 8**
 - **APPROACH TARGETING FOR ANNEFRANK**
 - **1.1 m/s, MOVED THE APPROACH FROM 2200 TO THE DESIRED 3200 Km**

CURRENT ACTIVITIES

- **INTERSTELLAR PARTICLE COLLECTION PERIOD 2**
 - **AEROGEL GRID DEPLOYED ON ON 8/5**
 - **EXPOSED TO THE PARTICLE STREAM UNTIL 12/9**
- **COMET ENCOUNTER TEST AT ANNEFRANK**
 - **STL TESTING**
 - **NAV CAMERA FSW UPGRADE**
 - **ENCOUNTER SEQUENCE**
 - **TCM-7A, ANNEFRANK TARGETING, COMPLETED ON 10/8**
- **IPN SUPPORT HAS BEEN GOOD THIS PAST PERIOD**
 - **SUCCESSFULLY COMPLETED ONE NSP TEST TRACK ON 7/25**
 - **DSMS NSP PIT SHADOW TRACK COMPLETED ON 9/25**
 - **GOOD SUPPORT, EXCEPT FOR COMMAND**
 - **GROUND CONFIGURATION PROBLEM**
 - **COMMAND PORTION WILL BE RE-SCHEDULED**

<http://stardust.jpl.nasa.gov>

UPCOMING EVENTS

**INTERSTELLAR DUST COLLECTION 2
CONTINUES TO DECEMBER 9, 2002**

**ENCOUNTER TEST AT ANNEFRANK
NOVEMBER 2, 2002**

TCM 7B - DECEMBER 20, 2002

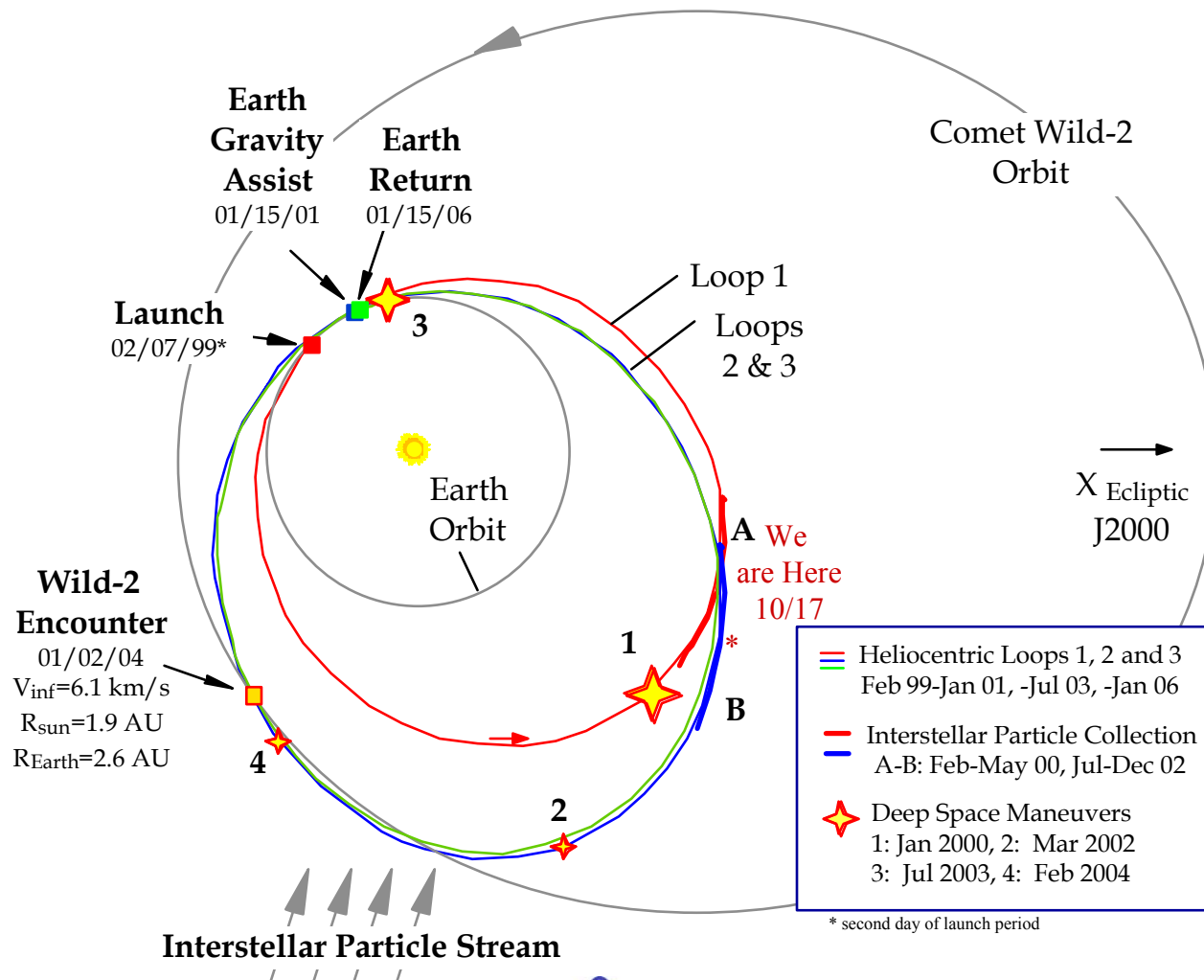


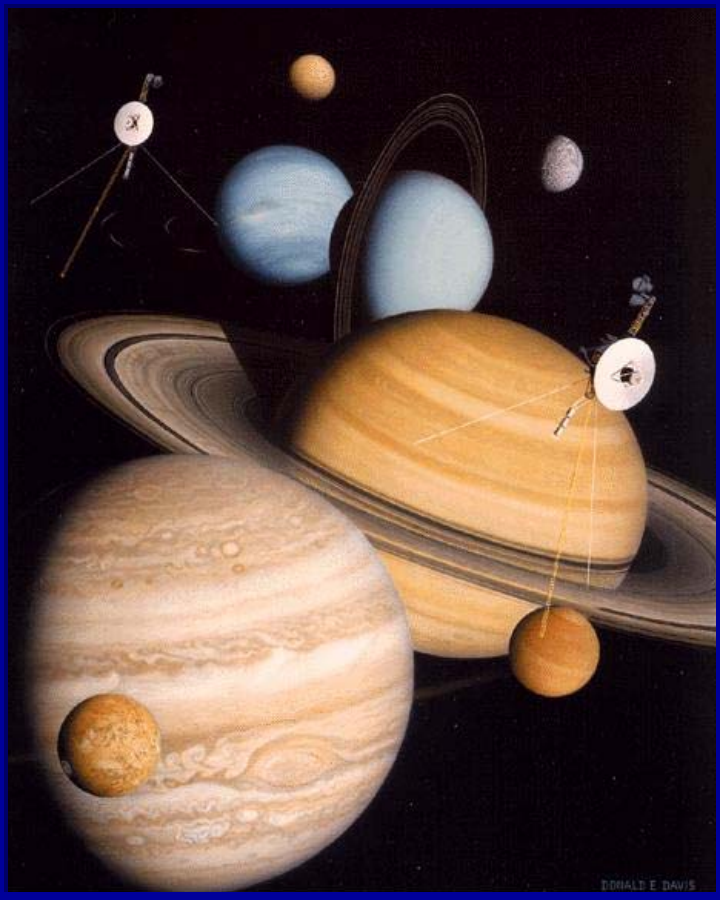
October 17, 2002



STARDUST

Report to JURAP





VOYAGER

FLIGHT OPERATIONS

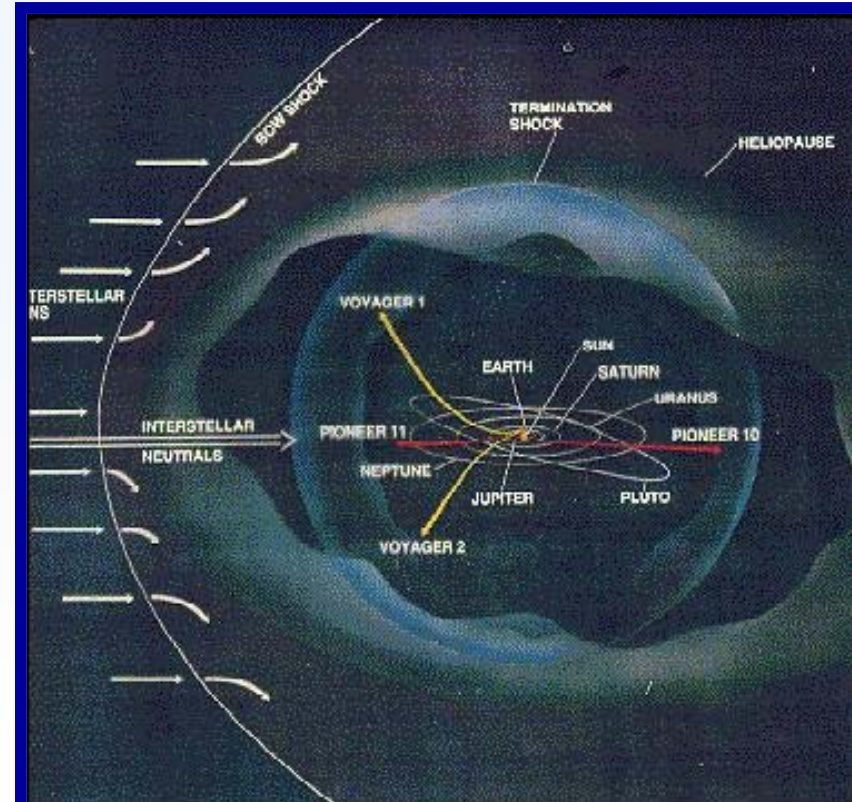
JOINT USERS RESOURCE ALLOCATION PLANNING COMMITTEE

Jefferson Hall
October 17, 2002

NASA Jet Propulsion Laboratory



<http://voyager.jpl.nasa.gov>





VOYAGER

FLIGHT OPERATIONS



FLIGHT SYSTEM STATUS

MISSION STATUS

VOYAGER 1

- * HELIOCENTRIC DISTANCE – 86.2 AU, RTLT – 24h03m34s
- * SPACECRAFT REMAINS HEALTHY
- * MAJOR ACTIVITY: PMPCALs, ASCAL, & MAGROLs

VOYAGER 2

- * HELIOCENTRIC DISTANCE – 68.5 AU, RTLT – 18h59m56s
- * SPACECRAFT REMAINS HEALTHY
- * MAJOR ACTIVITY: PMPCALs



VOYAGER

FLIGHT OPERATIONS



GROUND SYSTEM STATUS

(Sept. 13, 2002 - October 11, 2002)

- DSN - OVERALL SUPPORT – GOOD
- Voyager 1: On DOY 267, DSS-34 supported 1.8 hours in place of DSS-43 due to a red antenna. DOY 273, DSS-25 supported in place of DSS-14 due to a delayed return to operation. Others problems include rain [DR M101015, DR M101030], antenna problems [DR C101691, G101678], and transmitter problem [DR M101047]
- Voyager 2: On DOY 260, DSS-34 supported 9.3 hours in place of DSS-43 due to a red antenna at DSS-43. DOY 284, DSS-34 supported 1.1 hours in place of DSS-43 due to a red antenna at DSS-43.



VOYAGER

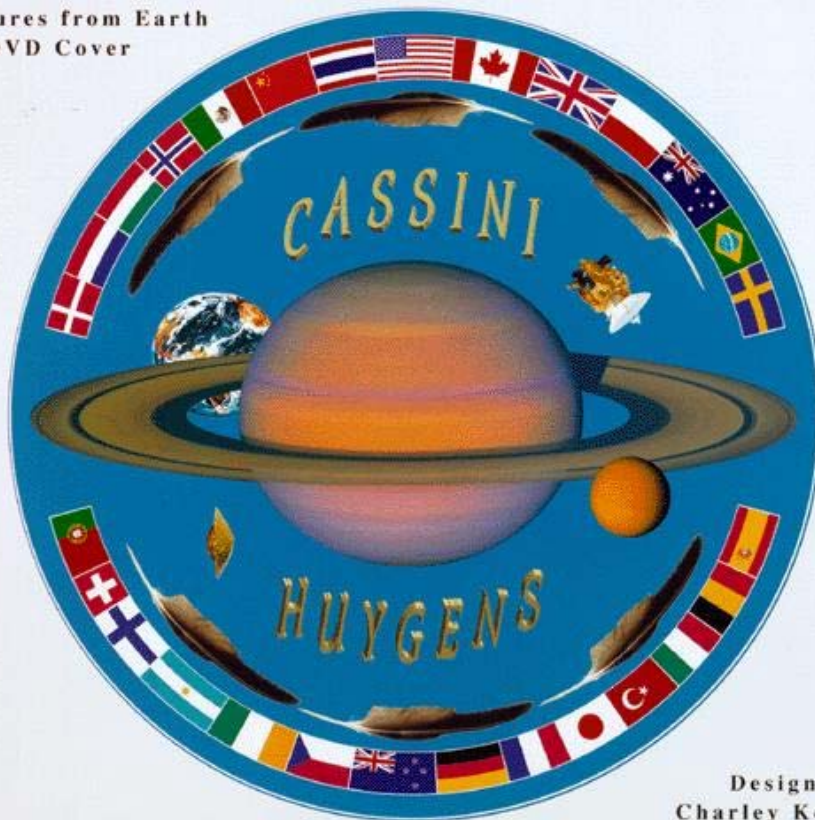
FLIGHT OPERATIONS



TOTAL SUPPORT TIME, OUTAGE TIME, % OF OUTAGE TIME

S/C	SCHED. SUPPORT	ACTUAL SUPPORT	70M TIME	SIGNIFICANT OUTAGE TIME	% OF OUTAGE TIME
31	413.9	413.9	122.2	6.4 (1.4)	1.9
32	283.1	283.1	108.3	0.0 (1.2)	.4

VOYAGER HOMEPAGE - <http://voyager.jpl.nasa.gov>



Design by
Charley Kohlase

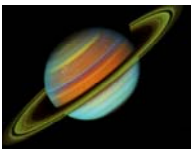
CASSINI

<http://saturn.jpl.nasa.gov/cassini/index.shtml>

Joint Users Resource Allocation Planning (JURAP) Committee Meeting

Dave Doody
October 17, 2002

NASA / Jet Propulsion Laboratory



Cassini

- **Thanks for accommodating extra passes in '03!**
- **In Space Science Subphase**
 - Space Science observations ongoing, S/C frequently off Earth between DSN playback tracks
 - PSG next week here at JPL
 - Tour advanced science planning continues. Nearly 10% of Tour sequences have been worked.
 - Analysis completed for last month's Huygens Probe checkout; all ok.
 - Additional routine S-band U/L testing scheduled for next month with MDSCC
 - Final NASA decision still pending regarding communications during SOI
- **Operations**
 - Daily ops going well, excellent DSN support; excellent NOPE support
 - Minor S/C instrument adjustments, cals, and anomalies being worked near real time
 - DSS25 Ka-band TXR testing with 5 Cassini passes next month
 - SFOF Clean power has been working reliably.
 - Discontinued NISN Voice & data line service to domestic Distributed Ops sites
 - CDS and AACS Flight Software testing is in progress
- **NSP**
 - Additional 2-way TRK shadow passes being scheduled so Nav can verify data
 - TLM tests to be worked in DTF21 to check out BVR + TLM s/s with HI, LOW, NO subcarrier
 - RS test(s) to be scheduled
 - PIT conducted, repeat being scheduled
 - Additional NSP tests being scheduled per DSN request